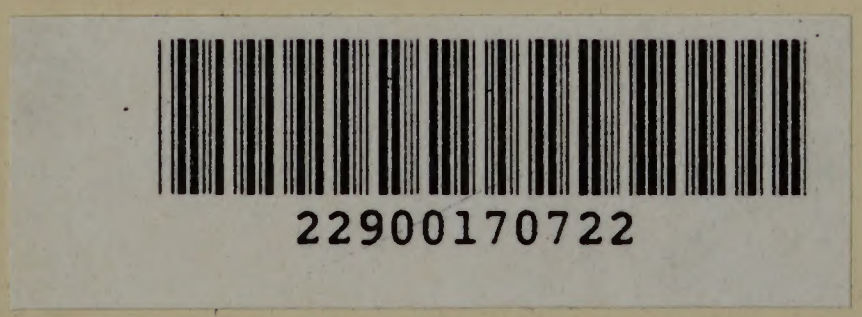
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The Pharmaceutical Journal

AND

Transactions.

THIRD SERIES.

VOLUME XIV.

1883-84.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 706.] SATURDAY, JANUARY 5, 1884. [PRICE FOURPENCE

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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, February 6th.

The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on February 6th should be forwarded to the Secretary not later than Wednesday, the 30th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

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BOTANY AND MATERIA MEDICA .....Professor BENTLEY.
On Thursday, Friday, and Saturday Mornings, at 9 o'clock.

PRACTICAL CHEMISTRY ..... Professor ATTFIELD.
Daily at 10 o'clock, in the Laboratories.

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The Lectures comprise the following subjects:—

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2. The chemistry of inorganic bodies, including a description of the elements and their more important inorganic compounds, especially those used in medicine.

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The subjects are fully illustrated with experiments, diagrams and specimens, and examinations of the class are held on those subjects which have been previously treated of in the lectures.

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The class in Practical Dispensing and the Reading of Prescriptions is conducted by Mr. Joseph Ince, in conjunction with Mr. A. F. Dimmock, and meets twice a week at 5 p.m.

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The Lectures comprise the following subjects:—

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2. Organic Materia Medica, comprising the medicinal substances obtained from the organic kingdom, which are considered in the order of the natural historical relations of the organized beings which produce them.

3. Systematic and Practical Botany, which is taught during the summer months in the Royal Botanic Society's Gardens, Regent's Park.

All the Lectures are fully illustrated by every means to which recourse can be had, including fresh, dried, and preserved portions of plants, together with their products and secretions; and by an extensive series of drawings, diagrams, and preparations, as well as by experiments and microscopical preparations.

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EIGHTEENTH ANNUAL BALL
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ON WEDNESDAY, 16th JANUARY, 1884.

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Attention is drawn to the following resolution of the Committee:—

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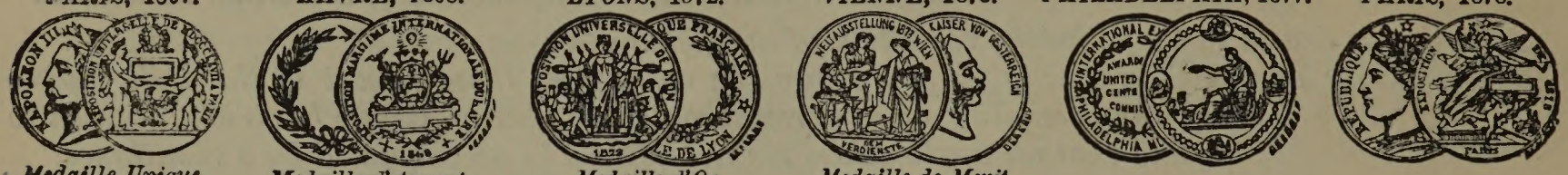

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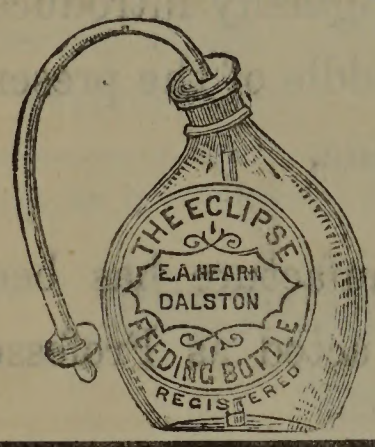

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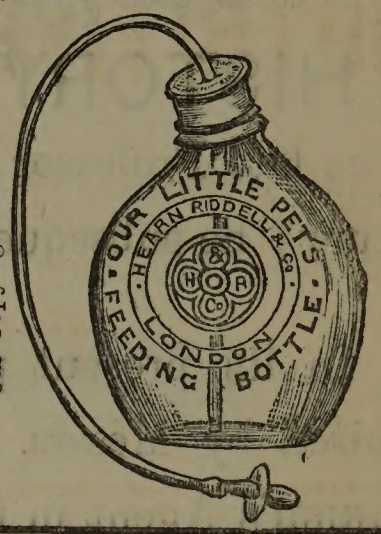

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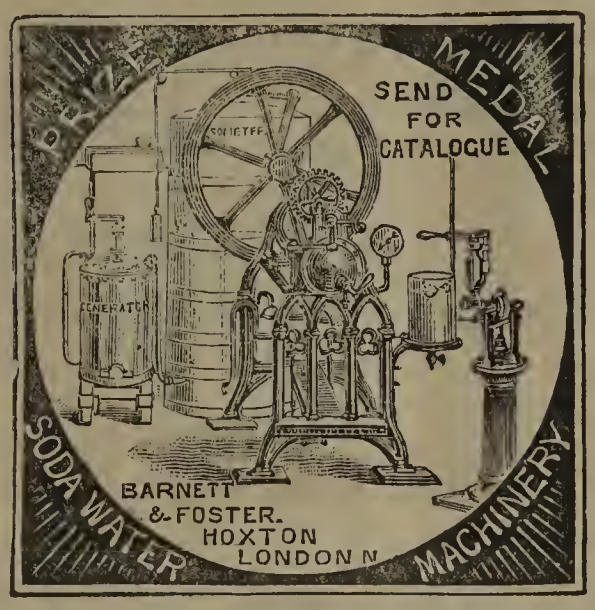

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The Pharmaceutical Journal.

SATURDAY, JANUARY 5, 1884.

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1883.

IF ever another section should be added to the 'History of Pharmacy,' the year that has just closed will have to be described as politically one of expectation and preparation rather than of achievement. It is true hopes were raised more than once during the twelve months that it would be possible to make a mark favourable to pharmacy upon the statute book; but they were frustrated by causes that hindered much other projected legislation. Nevertheless, the preparatory work was not altogether without result, for it was the occasion of the manifestation of a considerable amount of unanimity amongst the chemists and druggists of the country, which in one instance resolved itself into a hint of considerable significance. If, however, all was not accomplished that had been intended, the year was by no means uneventful in its pharmaceutical aspects, as will appear from the following paragraphs.

Assuming, as is reasonable, that the Council of the Pharmaceutical Society is essentially the executive for all the registered chemists and druggists in the country, we take up first the record of its doings. The Council has undergone no change in its constitution during the year. The fourteen members who retired in May according to the bye-laws were all of them re-elected, and at the meeting of the Council in June, Mr. M. CARTEIGHE was requested to continue in office as President, Mr. ATKINS as Vice-President, and Mr. ROBBINS as Treasurer. At its earliest meeting in the year the Council devoted several hours to the discussion of a draft of a Pharmacy Act Amendment Bill that had been prepared by the Law and Parliamentary Committee. The details were not then, however, published, as it was thought desirable that the Committee should first confer with the officials of the Privy Council on the subject. At the meeting in February the subject again came up for discussion, on the report of the Committee recommending the adoption of the draft Bill, which it was then decided should be printed. When the Bill came to be published it was found that in the preamble greater emphasis was laid upon the expediency for the safety of the public that *sales* of poisons and dispensing of prescriptions should be regulated than in the Pharmacy Acts of 1852 and 1868, where the regulation for the qualification of *sellers* of certain poisons had been most prominent. Perhaps the least expected feature in the Bill was a provision in this spirit to regulate the sale of certain articles which can be sold under present circumstances by unregistered as well as registered persons. It was proposed to effect this by instituting a new class of scheduled articles, to be termed "poisonous," and making their sale subject to certain restrictions as to labelling. This step had been taken after long consideration and in consequence of urgent representations from a body representing a class of persons who considered they were exposed to danger and injury by the unrestricted sale of the articles referred to. As a first instalment it was proposed that this "poisonous" schedule should include sulphuric, hydrochloric and nitric acids, butter of antimony and carbolic acid, all articles which may be sold without any restriction as to vendor or label. It is important to remember that these substances had been all included in a list of articles which the Council of the Pharmaceutical Society, acting under its statutory powers, had in 1882 resolved it was desirable to add to the second part of the poison schedule, though the Privy Council had declined to approve the resolution. Another provision in the draft Bill had for its object the preservation during at least twelve months of a record of the details of all sales of poisons contained in the first part of the schedule. Another regulation extended to patent medicines and would have made it illegal to sell by wholesale or retail any such articles containing a poison within the meaning of the Pharmacy Act, 1868, unless the box, bottle, package or vessel in which the same was contained, the wrapper if there were only one, or the outermost wrapper if there were more than one, were labelled with the name and address of the first seller of the same, the name of the patent medicine and the word "poison." In the case of a "duly qualified keeper of an open shop for the sale of poisons" becoming subject to a penalty for breach of this provision in respect of a patent medicine not prepared by himself he was to have a right of indemnity against the person who supplied him with it, this right passing to all intermediate dealers until the real offender was reached. The unqualified keeper of an open shop had no such remedy and under another clause of the Bill he would be breaking the law in selling by retail a patent medicine containing a "poison." With respect to persons carrying on business, perhaps the most important provision was one to extend the scope of the present law and make it illegal for any person "to sell by retail, or to keep open shop for "retailing, dispensing or compounding medical pre-"scriptions or (whether as patent medicines or "otherwise) poisons" within the meaning of the Pharmacy Act, unless he were qualified by registration or came under the exemption as a trustee or administrator of the estate of a deceased pharma-

cist. In order to make the law more effective it was provided that in every case the seller upon whose behalf the sale was made should be deemed to be the person to whom the regulations as to the sale of poisons applied, whilst any assistant, apprentice or other servant was to be deemed to be simply the agent of the seller on whose behalf the sale was made. It was also provided that words importing the singular number only should include the plural, and in order to meet any case where doubts might exist as to the real owner or owners of a shop, it was proposed to give the Registrar power to serve an application for such information, requiring its delivery within seven days under a penalty. The Bill also proposed to make it unlawful for any qualified keeper of an open shop for retailing, dispensing or compounding medical prescriptions or poisons to keep open shop in more places than one without placing a qualified person *bonâ fide* in charge of each branch shop. Other clauses had for their object the conferring upon the Council the power to make, alter and amend by bye-laws the regulations as to examinations, and also to make it illegal for a chemist and druggist to take as an apprentice a person who was not registered as having passed the Preliminary examination. The promoters of the Bill, in addition, contemplated making an important alteration in the constitution of the Pharmaceutical Society, in that it was provided that every person who after December 31, 1886, might pass the qualifying examination under the Pharmacy Act, 1868, should be entitled to be registered as a "pharmaceutical chemist" and be eligible as a "member" of the Pharmaceutical Society; whilst any person who before that time might have been registered as a "chemist and druggist" in virtue of having obtained a certificate of qualification from the Board of Examiners would be eligible as a "member" of the Society, but not entitled to registration as a "pharmaceutical chemist."

The foregoing sketch will sufficiently reveal the nature of the draft Bill in the form in which it was adopted by the Council, and it includes all the points that subsequently became the subjects of adverse criticism. Within a short time of its publication meetings of chemists and druggists were held at nearly all the principal provincial centres, at which, as a rule, the provisions of the Bill were considered *seriatim*, the result being a more or less emphatic expression of approval of the Bill as a whole in every case. We think this is quite a sufficient refutation of an *ex cathedrâ* dictum put forth a short time since by a person who is a member of the executive of the Trade Association, though not a registered chemist and druggist, to the effect that the Bill had not been framed by the true representatives of the chemists and druggists of Great Britain. Indeed it would appear probable that the speaker himself had forgotten for the time that at the annual meeting of the Trade Association the members had formally resolved that it was "most suitable that chemists and druggists generally, should be united in support of the Pharmacy Bill." The points which gave rise to the greatest amount of objection were those relating to the institution of a schedule of "poisonous" articles, the provisions as to the labelling of patent medicines containing scheduled poisons, the requirement of qualified managers for branch shops, and the proposition which would result eventually in only one grade of legal qualification and one kind of membership of the Society. The objections to the "poisonous" schedule proceeded from a somewhat unexpected quarter, and were not based upon the assumption of any possible restriction of trade by the regulations applying to the articles in that schedule, this point indeed having been satisfactorily disposed of by the majority of replies to the inquiry previously made by the Council throughout the country through the medium of the local secretaries. The objectors, who had Mr. G. F. Schacht for a leading spokesman, saw in the imposition of regulations applying to unregistered persons who sold such substances as it was proposed to class as "poisonous," a departure from the broad principle hitherto advocated by the Society that in the interest of the public only qualified persons should be allowed to deal in any such dangerous substances. In fact they preferred that the practice should remain as it is rather than the Society should recognize in any way the traffic in poisonous substances by unqualified persons. When the Bill was under the consideration of the executive of the Trade Association, this view was endorsed by a majority of 7 to 5, and a resolution was passed that among the amendments to the Bill to be suggested should be one to the effect that the whole of the clause dealing with the subject should be erased and the articles in the special schedule added to the second part of the poison schedule. This suggestion, with others, was in due time transmitted to Bloomsbury Square, but unfortunately without any mention of the manner in which it was contemplated that the latter part of the proposed amendment was to be carried into effect in the face of the opposition of the Privy Council. On the other hand, it was known that the Government had announced its intention of promoting legislation further to regulate the supply of poisons, and an indication had been given of its views upon the subject in the refusal of the Privy Council to approve the resolution of the Council of the Pharmaceutical Society that the articles specified ought to be included in the existing schedule. Moreover, it appeared to many that the restriction as to labelling would exercise an influence in the direction desired. It was, therefore, thought wiser by the majority of the Council and, we believe, of the trade, to recognize the situation and by responding to the good will of the Government, manifested in the request for advice, to bring a legitimate influence to bear in the interest both of the public and the trade. The criticisms of the

provisions as to patent medicines were of a two-fold character. One took the form of an objection to the retail vendor being made primarily responsible for insufficient labelling, with a right of indemnity, instead of limiting the responsibility to the maker. The subject was discussed at the Annual Meeting of the Society, on a motion made by Mr. G. W. SANDFORD to the effect that the clauses should be altered, which, notwithstanding the suggestion that the incoming Council should be invited to reconsider the clauses, was carried by a small majority. The other criticism was that the word "and" should be inserted so as to ensure that the outer wrapper, as well as the containing vessel, should be always labelled "poison," and it was also suggested to require the name of the poison to be mentioned. The objections made as to the clause necessitating the passing of the Preliminary examination before apprenticeship have not been very numerous, whilst those directed against the requirement of qualified managers for branch shops, though in some instances originating in a dislike to the giving of any sanction to one person being proprietor of more than one business, have, as a rule, been somewhat sentimental and mainly based upon considerations of hardship in particular cases, although the provisions would affect none disadvantageously but those who have chosen to ignore the legislation of 1868. Lastly, although there have been some remonstrances against what has been termed the abandonment of the Major qualification, which phrase, however, does not describe what is intended quite correctly, the proposition has on the whole been received in the most liberal spirit by those who have acquired the title of "pharmaceutical chemist" by undergoing voluntarily an extra examination. As previously remarked, no very obvious result has attended all this preparatory work. The draft Bill was communicated to the Government and in March Mr. MUNDELLA announced that it was intended to introduce a Bill into the House of Lords, though little was revealed as to its nature beyond the statement that it would deal with patent medicines containing poisons. But the Government intentions in this direction, as well as in others, were frustrated and the session slipped away before anything further was done. The subject came up at the meeting of the Council last month, on the reading of a stimulant communication from the Lincolnshire Association for the Prevention of the Administration of Poisonous Drugs to Horses. The President then stated that he had reason to believe the subject was still under the consideration of the Government; but Mr. BOTTLE and Mr. HAMPSON appeared to be of opinion that if the Government does not soon move in the matter the Council should take steps to introduce a Bill independently.

In March a Bill for the Consolidation and Amendment of the Law relating to Medical Practitioners was introduced by Lord CARLINGFORD into the House of Lords. It proved to be essentially a Bill for reducing to order the incongruities at present affecting the system of medical examination and for the protection of medical titles; but it was free from the class of provisions in regard to "counter practice" that have made several previous medical bills obnoxious to chemists and druggists. The Bill dealt, however, with one subject in which pharmacists are closely interested, the preparation of new editions of the national Pharmacopœia, in regard to which it provided for a continuance of the existing arrangements, ignoring the opinion formally recorded by the Council of the Pharmaceutical Society that practical pharmacists should be associated with any future Pharmacopœia Committee. At the April meeting of the Council, therefore, Mr. HAMPSON moved that, as the Bill contained no provision by which pharmacists would be empowered, conjointly with members of the Medical Council, to revise and prepare future editions of the British Pharmacopœia, a Committee should be authorized to take steps to remedy the omission. The motion was carried unanimously and, as a consequence, it was reported at the next meeting that the President of the Society had had an interview with the Lord President of the Council, and had ascertained from him that the Government was not disposed to agree to the principle of the desired alteration in the Bill. Meanwhile it had become known, by the publication of an official report, that the Medical Council had long before made arrangements for the preparation of a new edition of the Pharmacopœia and that several months previously Professors REDWOOD, BENTLEY and ATTFIELD had been engaged to carry out the work under the direction of the Pharmacopœia Committee. The subject was broached at the May meeting of the Council by Mr. GREENISH, who expressed his disapproval of the course that had been taken by the Professors, a sentiment that was endorsed by several other members. Subsequently a copy of a printed memorandum, similar to others sent to many individuals resident in different parts of the country, was addressed to the President and Council of the Pharmaceutical Society, stating that the Pharmacopœia Committee would be happy to receive suggestions and to give them their most attentive consideration. It was unanimously agreed that this was not the form or degree of representation on the Pharmacopœia Committee to which pharmacists should be entitled, and it was resolved, if necessary, to oppose the Bill in Parliament, authority being given for the drawing up and sealing of a petition for presentation to Parliament if necessary. A similar view of the general subject was taken by the Council of the Pharmaceutical Society of Ireland, which found expression in a memorial presented to Lord CARLINGFORD and a petition to Parliament that was confided to the President of the British Society for presentation at

an opportune moment. A few days afterwards a memorial was drawn up for presentation to the Privy Council, in which the case of the pharmacists was briefly stated and the insertion of a new clause in the Bill was suggested to the effect that a Pharmacopœia Committee should be established consisting of six medical practitioners, to be nominated by the Medical Council, and five Pharmaceutical chemists, four to be nominated by the Pharmaceutical Society of Great Britain (one to be resident in Scotland), and one by the Pharmaceutical Society of Ireland. Notwithstanding every effort, however, the Bill went down to the House of Commons without alteration in the direction desired. It was, therefore, felt that the time had come to prepare for making the influence of the trade felt in a constitutional manner. A form of petition, based upon the memorial was drawn up, copies of which were supplied to Local Secretaries of the Society in the provinces and to leading pharmacists in London, and through the praiseworthy efforts of those gentlemen, upwards of two hundred well-signed petitions were soon ready for presentation through the local members of Parliament upon reception of a notice from the Committee. The Bill, however, made little progress, having been "blocked" in the interests of some of the medical corporations affected by it, and the petitions were not presented until August, a few days before the Bill, notwithstanding much pertinacity on the part of the Premier, received its quietus by withdrawal before it had been read a second time. There is reason to believe, however, that the authorities have now become more appreciative of the views of pharmacists upon this subject, and it is hoped that this will become apparent in any future Medical Bill.

Another parliamentary Bill that occupied the attention of the Council was the Patents Bill, which, as originally introduced, contained a provision relating to the use of the royal arms, which might have become a source of great vexation to pharmacists, as well as to tradesmen generally. Attention having been called to the clause by Dr. Symes, it was decided that an attempt should be made to effect its modification. After some correspondence, the Board of Trade drew up an amended form of the clause and suggested that if satisfactory the Council might arrange for this to be moved on the report of the Bill; the amendment was accepted as satisfactory, and was eventually adopted in Parliament. The Explosives Bill was passed in such haste that no time was given for its consideration; but immediately after it had passed attention was called in these columns to its possible aspect towards chemists and druggists carrying on a certain class of trade, and this view was confirmed subsequently by a communication from the Home Secretary. In order, therefore, to prevent as far as possible annoyance as the result of ignorance, our readers were supplied with a *résumé* of the Orders in Council applying to the sale and keeping of explosives. Bills for the amendment of the law of partnership and the registration of firms, both of which would have to some extent affected the working of the Pharmacy Act, were introduced into Parliament, but failed to pass, and the same fate befell a Petroleum Bill.

Education and examination are subjects that every year occupy a large portion of the time of the Council. In March a Committee appointed to consider the best method of giving effect to the resolution passed by the Council in the previous year in respect to the establishment of a curriculum presented a report. The Committee made sundry recommendations which it was suggested should, with those previously adopted, be incorporated into the bye-laws, and come into force after the end of 1887. The chief feature in the Report was a recommendation as to the division of the qualifying examination into two parts, one of them to be a written examination on prescriptions, pharmacy and theoretical chemistry, to be conducted in London and Edinburgh and certain local centres; the other to be *vivâ voce*, dealing with practical dispensing, botany, materia medica and chemistry, and confined to London and Edinburgh. This recommendation was practically identical with one that had been rejected in the previous year, the only difference being that the proposed interval between the two parts of the examination had been extended from six months to one year. The proposition was strongly opposed by Messrs. Hampson and Williams, who looked upon it as *ultra vires*, and by Mr. Greenish, who objected to a written examination upon prescriptions and pharmacy. On a division, however, the report was adopted by a large majority. The subject then lapsed until August, when Mr. Schacht urged that steps should be taken to carry out the resolution of the Council, and in October a Committee was appointed to frame, with the assistance of the Solicitor, the necessary modifications in the bye-laws. In May the sanction of the Council was given to the new regulations for conducting the Preliminary examination which will come into force for the first time at the examination to be held next week. These regulations are altogether favourable to the candidates, since they secure a longer and definite time for each subject, and in the Latin a choice of one of two authors is given.

Whatever may be the amount of deterrent influence exercised by inroads of unqualified competitors or the stringency of the examinations, these causes combined are insufficient to prevent an increase in the number of aspirants to enter the business of a chemist and druggist. The gross number of persons who came up for examination last year reached 2426, being an increase, as compared with the previous year, of 396, in which all the examinations shared. For the Preliminary examination there were 1539 applicants, against 1260 in 1882, of

whom 770 passed, or just 50 per cent., showing again a slight improvement. There were also 93 certificates received in lieu of examination, making no less than 863 persons who thus crossed the threshold of pharmacy. The legal qualifying, or Minor, examination, which had in respect of the number of candidates remained stationary at about 650 for three previous years, rose last year to 766; but the failures were very numerous, only 294 or 38·4 per cent. having passed, so that notwithstanding the largely increased number of candidates only six more persons became entitled to registration than in 1882. The statistics as to the Major examination are relatively satisfactory; for there were 111 candidates, of whom 55, or 50 per cent. passed, against 103 candidates in the previous year, with 60 per cent. of failures. In view of the large proportion of failures in the Minor examination, which might suggest the idea that it is made unduly stringent, it is important to note that Dr. GREENHOW, the Government visitor at the examinations held in London, in his last report says that whilst it may possibly happen that a rather weak candidate occasionally passes, he believes that no competent candidate is ever rejected. Dr. MACLAGAN, too, the Government visitor at the examinations held in Edinburgh, in his report says that he "cannot attribute the large "proportion of failures to any other cause than the "want of preparedness, and the ignorance of what "constitutes preparedness, on the part of the candi-"dates." Indeed, he expresses an opinion that if the project of the Council be carried out with respect to the unification of the examinations an effort should be made to "raise the standard of the pass examination at least up to the level of the present Major." Whilst referring to these reports it may be mentioned that with respect to the proposed division of the examination, and the conducting of one portion in writing at local centres, Dr. GREENHOW holds views resembling those of Mr. GREENISH, and he also looks with disfavour upon the proposal to make a curriculum compulsory.

The Benevolent Fund has, as always, been the object of much solicitude on the part of the Council; nor is there any reason to be dissatisfied with the result. The yearly income to this noble fund is now a large one, and it is dispensed in the most catholic manner. There is still reason to regret that so small an interest is taken in it by the greater number of chemists and druggists who are not members of the Pharmaceutical Society, and in February last, the Council tried to cope with some of this indifference by sending a copy of this Journal, containing a list of the subscribers and a statement of the manner in which assistance is given, to every chemist and druggist on the register. The income during the year, independent of the interest upon invested capital, amounted to £1922 2*s*., consisting of £1535 17*s*. in subscriptions, and £386 5*s*. in donations. On the other hand the expenditure has amounted to £1964 5*s*., the sum of £1283 15*s*. having been spent in annuities, and £680 10*s*. in casual relief. During the year the list of annuitants has been decreased by seven, through death; but it has also been augmented by the election last month of six new annuitants, making the number now forty-one, of whom thirty-one are in receipt of £35 a year, they being over sixty-five years of age. For these annuities the annual responsibility amounts to £1385, and assuming that the casual relief granted in the coming year will reach the sum given in the past, it will be seen that upwards of £2000 will be required to meet the probable expenditure in 1884.

Among other subjects that have occupied the attention of the Council has been that of the investment of the capital of the Society, which previously had been made exclusively in Government funds. At the meeting in March the Finance Committee in its report recommended that a portion, not exceeding three-fourths of the invested capital, should be reinvested as occasion might offer in freehold ground rents or freehold ground. An amendment was moved by Mr. WILLIAMS, but the recommendation was adopted. The reference to the subject in the Report of the Council provoked some criticism from Messrs. SANDFORD and STACEY at the Annual Meeting, but no adverse motion was made and the resolution has since been acted upon to some extent. Another transaction was in respect to a desire that had been expressed that in addition to the class of Honorary Members of the Pharmaceutical Society at present in existence there should be a class of Corresponding Members, to be elected annually under similar conditions and to consist of persons who have distinguished themselves in connection with pharmacy or the allied sciences. In January the subject was, on the proposition of the President, referred to a Committee, which in March reported in favour of the suggestion, and recommended that a bye-law for the institution of such a class should be drafted ready to be brought forward at a convenient opportunity. In March, too, the Committee to which the subject of the importation and sale of spurious and worthless drugs had been referred reported that the practice was not on the increase and did not need further legislation to control it, but recommended the appointment of a permanent Committee to receive information, collect specimens and have them examined, and publish occasional reports. A committee was, therefore, appointed in accordance with the recommendation.

In the course of the year about one hundred and twenty reports of alleged infringement of the Pharmacy Act, in the selling of scheduled poisons by unregistered persons, were received by the Registrar. In the majority of cases any illegal practice that was being carried on was discontinued upon the receipt by the offender of an official letter of warning. In some cases, however, where the offence was per-

sisted in, the authority of the Council to institute legal proceedings was given, and in certain instances it became necessary to recover penalties. There have also been about a dozen cases of prosecution under the 17th section of the Pharmacy Act reported, some of which have been instituted by the executive of the Trade Association and others by the police. There have been a few prosecutions of chemists and druggists under the Sale of Food and Drugs Act, one conviction being obtained for the substitution in dispensing a prescription of cinchonidine sulphate for quinine sulphate, and another for the substitution of sodium salicylate for methyl salicylate. Another batch of cases with respect to the alleged sale of defective spirit of nitrous ether and tincture of quinine were of a very trivial nature and were most of them dismissed. There have also been three convictions under the Patent Medicine Act, apparently due to forgetfulness of the fact that the recommendation of any preparation for internal use as a medicine necessitates the use of a stamp. One curious action brought against a chemist for damages resulting from the loss of a dog, which had helped itself to poisoned food during its perambulations on the wrong side of the counter, was very properly dismissed; but in another action, where loss of life resulted through substitution of a preparation of aconite for one of actæa, damages were awarded, which, it is understood, were paid by the wholesale firm in whose establishment the mistake originated. About an average number of cases of accidental poisoning have been reported, amongst which the particular poisons that the Council of the Pharmaceutical Society has attempted to bring under restriction figure prominently. One of the most noticeable, a glaring case of poisoning by a so-called patent medicine, will be found on another page of the present number.

With the month of May came the Annual Meeting of the Pharmaceutical Society, which was numerously attended. The Report of the Council and the verbal commentary upon it which constituted the President's address were well received, and although the curriculum scheme was the subject of some criticism and an amendment it was warmly defended and the Report was eventually adopted *nem. con.* Mr. Sandford then brought forward a motion for the alteration of the clauses in the draft Bill relating to the responsibility for imperfect labelling of patent medicines containing poison, which, as already stated, was carried. On the evening preceding the meeting the members of the Society and their friends dined together as usual, being favoured with the company of the Lord Mayor and Sheriffs, and a number of distinguished medical and other scientific men. On the evening of the meeting the usual Conversazione was held at South Kensington, which was also largely attended.

The Inaugural Meeting of the Session held in October, was rendered notable by two events. After the usual reports of the Professors, which it is hardly necessary to say were commendatory of the past students, and the distribution of the prizes, an admirable address was delivered by Professor Michael Foster, F.R.S., upon the subject of examinations. This was followed by the presentation of the Hanbury Medal to Mr. John Eliot Howard, F.R.S., to whom it had been awarded by the Committee constituted in accordance with the trust-deed. The occasion was one of deep interest and no one present could have anticipated that the eminent quinologist, who seemed to bear his years so well, would pass away within a few weeks from the time of receiving the honour. One drawback to the evening's proceedings was the announcement that the examiners were again, as two years previously, unable to award the Pereira Medal. With respect to the ordinary Evening Meetings it may be stated that the supply of papers has been moderately well sustained, the number read during the past year having been fifteen as compared with ten in the previous year. It may fairly be said also that most of them were of considerable interest, as will be seen from the following list:—"A Research on the Alkaloid Gelsemine and Some of its Crystalline Salts," by Mr. A. W. Gerrard; "Uranium Oleate," by Mr. W. Gibbons; "Liquid Extract of Cinchona," by Dr. B. H. Paul; "The Bitter Principle of Hymenodictyon Excelsum," by Mr. W. A. H. Naylor; "Remarks on Some Medicinal Plants of Ceylon," by Dr. W. C. Ondaatje; "Note on Essence from Green Ginger," by Dr. C. Symes; "A Note on Sap," by Professor Attfield; "The Classification and Properties of Red Resin known under the Name of Dragon's Blood," by Messrs. Dobbie and Henderson; "The Preparation of Lard for Use in Pharmacy," by Professor Redwood; "Notes and Suggestions upon Tincture of Nux-Vomica," and "On Extract of Nux-Vomica," by Messrs. Dunstan and Short; "Tincture of Cinchona," by Mr. E. G. Hogg; "The Alkaloidal Strength of Tinctura Cinchonæ Flavæ," by Mr. J. O. Braithwaite: "The Purgative Principle of Croton Oil," and "The Vesicating Principle of Croton Oil," by Mr. H. Senier. It it much to be regretted, however, that the Evening Meetings of the Society are not used by a larger number as a means of bringing forward the results of observations in practical pharmacy, which must often involve points that could be more profitably and conveniently discussed on such occasions than in any other way.

Among the educational appliances of the Society the Library and Museum hold a conspicuous place. It is satisfactory to be able to report that there has again been a marked increase in the attendance, the numbers having been 6011 in the daytime and 1764 in the evening, against 4260 and 1513 in 1882. The books taken out from the Library have been 3238, or within a dozen of the number of the previous

year. During the same time about three hundred books and pamphlets have been received. An extensive manuscript 'Bibliography of Pharmacy' has also been acquired, and is now available for reference. In the Museum considerable alterations have been made. With the view of rendering its resources more available for purposes of study the crowded specimens in the Materia Medica Museum have been thinned out and those only left in it which it is desirable that students should become acquainted with; specimens which are chiefly used for purposes of comparison or reference, or which have only an historical interest, as well as the collections illustrative of the Indian and United States Pharmacopœias, have been removed into a new handsome series of cases around the walls of the examination room. Additional tables have also been placed in the Materia Medica Museum to permit of a larger number of students using the specimens at the same time. Another feature, which it may be hoped will prove useful to visitors, is the addition of a case for the exhibition of recent donations to the Museum or of new remedies, so that drugs or chemicals of recent introduction may be easily seen. This case will probably be open to inspection early in 1884. The Museum has been enriched during the past year by the addition of a valuable series of cinchona barks from the Government plantations and gardens in Madras, Darjeeling, Ceylon and Jamaica, their value being still further enhanced by a collection of herbarium specimens obtained from the identical trees from which the bark was gathered, and the fact that in many cases the bark is accompanied by the report of an analysis of it made by Dr. Paul. Among the more noteworthy of the additions to the collection of foreign drugs may be mentioned a series of Japanese drugs, presented by the Director of Kew Gardens; a number of Brazilian drugs, presented by Messrs. T. Christy and Co. and Messrs. Symes and Hallawell; some interesting specimens of native Natal drugs, from the Curator of the Botanical Gardens, Mr. J. M. Wood; some Cinghalese remedies, from Dr. Ondaatje; a very interesting collection of specimens from Mr. R. Jamie, of Singapore, including a section of the stem and foliage of the Siam benzoin tree, which has been hitherto unknown, as well as a very complete and valuable series of the different varieties of the famous ginseng root of China; and a series of drugs used by the Cree Indians of Hudson's Bay Territory, from Mr. W. Haydon. The attendance in the Museum during the year amounted to 6268, being 5064 in the morning and 1204 in the evening. Some of the donations to the Museum are, we believe, in sufficient quantity to permit of chemical examination, and the Curator will no doubt be pleased to hand such to any competent gentlemen who are willing to investigate them.

The North British Branch of the Pharmaceutical Society would appear to have had a fairly prosperous year. The Library and Museum continue to be well appreciated, and our pages bear evidence that the Evening Meetings have been marked by the reading of some extremely valuable papers. At the Annual Meeting in April a favourable Report was presented, and Mr. Alexander Napier having retired from the presidential chair, Mr. John Nesbit, who had in the previous year been Vice-President, was chosen to fill the office of President, whilst Mr. Henry Bellyse Baildon succeeded him as Vice-President.

In the sister island the course of events has transferred the Pharmaceutical Society of Ireland from a temporary shelter in the King's and Queen's College of Physicians to a home of its own in Harcourt Street, Dublin. The Annual Meeting was held in October, and it is much to be regretted that the address of Professor Tichborne revealed the fact that the characteristic negligent indifference of pharmacists is even more marked in that country than in this; for although more than two hundred licentiates had been enrolled in the thirteen years the Irish Pharmacy Act had been in operation, only between sixty and seventy were then members of the Society. Considerable activity has been manifested by the Council in enforcing the law, though legal proceedings will probably prove too expensive a luxury to be long indulged in unless the income of the Society is increased by the adherence of a larger proportion of those interested in keeping trespassers off the domain of pharmacy. Early in the year a request was received from the Government for information as to the working of the Sale of Poisons Act, Ireland. In reply, it was stated that by duly qualified pharmaceutical chemists and apothecaries the provisions as to labelling, etc., were carried out, but that they were ignored by the large class of general tradesmen, who under the Act are in Ireland allowed to deal in poisons; and it was recommended that in order to exercise some control the registration of all sellers of poison should be made compulsory. The Council has also had under its consideration the amendment of the Pharmacy Act, Ireland, and, as already mentioned, it joined with the British Council in endeavouring to secure the proper representation of pharmacists upon future pharmacopœia committees. A resolution having been adopted, at the suggestion of Professor Tichborne, limiting the term during which the office of President might be held continuously by one person, that gentleman, who had ably presided over the Society since he succeeded Sir Dominic Corrigan in 1878, vacated the Chair, and Mr. J. E. Brunker was elected the new President, Mr. Draper being chosen as Vice-President and Mr. Hodgson as Treasurer.

The Trade Association of Great Britain held its Annual Meeting in London in May. The Report presented cannot be described otherwise than as a gloomy one, since it showed a decrease in the income

associated with a diminished balance, and in the words of the Vice-President there appeared to be a threatening of a financial collapse. An energetic attempt was to be made to place affairs on a better footing, which we heartily hope may succeed; for the past history of the Trade Association shows that within its proper sphere such a body is capable of rendering great service in respect to the trade interests of chemists and druggists. No doubt the falling off is partly due to the prevalence of more peaceful conditions in the trade; but the very fact that such an organization is known to be in existence, and can be appealed to, is an influence for good, and to neglect to support it except under the temporary excitement of harassing prosecutions may prove to be the source of regret when too late. Mr. HAMPSON having declined to serve another year as President, Mr. HARRISON, of Sunderland, was elected to succeed him in the office.

The annual gathering of the British Pharmaceutical Conference was held in Southport, in September, and was well attended. It was marked by the delivery of an extremely vigorous address by the President, Professor ATTFIELD, which had more of a political character than is usual in communications to the Conference. Assuming that it was the intention of the Legislature in passing the Pharmacy Act, in 1868, to give to persons who qualify under its provisions a practical monopoly in the supply of medicine to the public, it was not very difficult to prove that no such result had ensued, and a rather gloomy future for British pharmacists was suggested as probable if the Legislature did not interfere to ensure that its original intention should be carried out. The address was extremely well received, and was the topic of an unusual amount of editorial comment in the daily papers, much of which purported to be in favour of some legislation, though somewhat incoherently and with much difference of opinion as to its extent and nature. The scientific and practical papers read at the meeting were quite up to the average in quantity and quality, and most of them will be noticed elsewhere. The British Association also met in Southport, immediately after the close of the Conference, under the presidency of Professor CAYLEY. The American Pharmaceutical Association met in the same month at Washington, and the German Association in Wiesbaden, and both of the meetings appear to have been successful. In Vienna the first International Pharmaceutical Exhibition was held under the auspices of one of the Austrian Imperial Princes, and both in respect to the exhibits and the number of visitors it proved a very satisfactory experiment. Another meeting presenting points of interest to pharmacists was that of the Social Science Association at Huddersfield, in October, when papers were read on the amendment of the law relating to poisons by Professor TIDY and Mr. G. L. BROWNE. The former gentleman advocated the abolition of an authoritative schedule of poisons, arguing that the onus should be thrown upon the seller of deciding what articles he would treat as poisons, and he also maintained that in not issuing compulsory regulations as to the storage of poisons the Pharmaceutical Society had neglected a duty imposed upon it by law. The opportune presence of the President of the Society at the meeting, however, allowed of some light being thrown upon the question from another point of view. Amongst other societies that deserve special mention may be instanced some consisting mainly of junior pharmacists, such as the School of Pharmacy Students' Association, members of which have contributed valuable papers to the meetings of the Pharmaceutical Society and of the Conference, the Chemists' Assistants' Association in London, and a similar association in Edinburgh. At Hawick a new association has been started that promises to do well, and still more recently a students' association has been commenced at Hanley.

It cannot be said that the past year has yielded any very important contribution to the vegetable materia medica, such new remedies as have been recommended—and these have been not a few—consisting principally either of contributions from the chemical laboratory or new applications of old medicines. Neither has the year been so fruitful as some of its predecessors in the elucidation of obscure points as to botanical origin, some little advance made towards the identification of the tree yielding Siam benzoin and the contribution made by Drs. DOBBIE and HENDERSON to the history of the resins passing under the name of "dragon's blood" being almost the only noticeable incidents. The article which has probably occupied the pen most has once more been cinchona bark, one fact becoming more and more apparent that although cinchona cultivation is still increasing in different parts of the world, especially in Ceylon and Jamaica, considerable uncertainty exists as to the exact species that are being grown. It is evident that until this confusion is cleared up the commercial cultivation of the plants can only be carried on by rule of thumb, and the assistance the chemist would be capable of rendering to the cultivator will be minimized through the shortcomings of the botanist. Nevertheless some interesting facts have been placed on record, and one or two of these point to the probability that when the botanist has done his work, he will only have made it still more evident that the cultivator must always look to the chemist to help him to decide under what conditions of growth any species or variety of *Cinchona* may be made to produce the most favourable yield of alkaloid. In the first place Dr. TRIMEN has reported some experience with what were believed to be succirubra plants all raised from one kind of seed, which seems to show that elevation has a great influence on the development

of alkaloids, nearly twice as much alkaloid being found in the bark grown at a height of 5500 feet as in the bark grown at 1500 feet, whilst the alkaloid in the former case was mainly lævorotatory (quinine and cinchonidine) and in the latter case principally dextrorotatory (cinchonine and quinidine). Analyses made by the late Mr. J. E. HOWARD of barks from different elevations in Jamaica and in Ceylon appeared to confirm this inference, and it is worth mentioning that in all the cases the bark grown at the lower elevation, though considered to have the best appearance, was poorest in alkaloid. Mr. D. HOWARD has recorded the observation that whilst in renewed bark produced on trees after stripping according to Mr. McIVOR's plan, in which alternate strips are removed down to the cambium, the proportion of quinine is higher than in the original bark, the reverse is the case in renewed bark produced after the "shaving" process, in which the bark is usually removed uniformly and superficially, the tendency being then to develop cinchonidine at the expense of quinine. He also states, as evidence of the field there is for skill in the selection of cinchonas for cultivation, that he has met with original "red bark" yielding 4 or 5 per cent. of quinine, whilst calisaya bark from individual trees, grown in Ceylon under apparently similar conditions, varied from 3 to 9 per cent. in their yield of quinine. Such a result is perplexing; nevertheless, the general results seem to show that, other things being equal, the plants yielding the most valuable barks grow in the richest soil, which is quite in accord with what might be expected and also with the experience of Mr. BROUGHTON, published a dozen years ago. A similar lesson as to the relative effect of the depth to which the bark is removed appears to be taught by some analyses, made by Mr. J. HODGKIN, of different pieces of Ceylon succirubra quill bark taken from the same consignment, some being natural, some renewed, and some partially natural and partially renewed on the same piece. In the renewed portion of the natural-renewed quill, where the shaving removed would necessarily be decreasingly thin, the quantity of quinine was less than in the entirely natural quills, while the cinchonidine was more than double. The entirely renewed bark showed an increase of quinine equal to 75 per cent., which more than outstripped the increase in cinchonidine. The cinchonine did not show much variation, but there appeared a considerable diminution of alkaloid in the natural bark in juxtaposition to the renewed bark. Similar results have been obtained before, though Mr. HODGKIN has been the first to make them known. Of course the value of any inferences drawn from these results would be dependent upon the extent to which the different pieces analysed were comparable one with another. Dr. HESSE has added two more to the already long list of cinchona alkaloids,—concusconine and concusconidine,—and he has endorsed the claim of the substance isolated from cuprea bark almost simultaneously by three sets of observers to be considered a new alkaloid. He, as well as others, has failed to obtain the crystalline compound of quinine and quinidine which was rather too hastily assumed to have been mistaken for a new alkaloid, but Messrs. WOOD and BARRETT have now published definite instructions for the preparation of this compound, as well as compounds of quinine and quinidine and quinine and cinchonidine with benzene, the difference in form of crystallization of which they state may be used as a delicate test for an admixture of cinchonidine with quinine sulphate.

Whilst on the subject of cinchona bark, it may be mentioned that Dr. PAUL, having been struck by the fact that a sample of professedly B.P. liquid extract of cinchona contained only a very small amount of quinine, was induced to examine several other samples collected from different sources and found that they all agreed in containing but a very small proportion of quinine, varying from mere traces up to 2 grains per fluid ounce. As the liquid extract, if it fully represented the alkaloidal contents of an official bark, would contain about 35 grains to the fluid ounce, Dr. PAUL made further experiments to ascertain whether an explanation was to be found in the official process being insufficient for the complete exhaustion, in which he used a sample of ordinary "flat calisaya," as now met with, and a sample of Indian bark, both of known composition. Upon analysing the liquid extracts made according to the B.P. process and the residual marcs, it was found that only about one-seventh part of the alkaloids in the original barks had passed into the preparations. These results were communicated to the Pharmaceutical Society at an Evening Meeting and gave rise to an animated discussion, Professor REDWOOD maintaining that the official conditions as to the choice of a bark had not been complied with, and that, therefore, the experiments could not be used as criteria in estimating the value of the official process. A remark made by Dr. PAUL to the effect that he could not confirm a statement by Mr. EKIN as to the tincture being a good preparation led that gentleman to request Messrs. HOGG and BRAITHWAITE to make some independent experiments, the results of which went to demonstrate the correctness of Dr. PAUL'S statement, that after the preparation of a tincture of cinchona by the official process as much alkaloid remains in the bark as the spirit has taken out. Connected with this discussion a bye-controversy was started in respect to the well-known preparation of the late Mr. BATTLEY, which, however, revealed little beyond the fact that that gentleman knew better how to keep a secret than was commonly supposed.

Considerable progress was made during the year in working out the chemical and pharmaceutical history of nux-vomica and its preparations, in a series of investigations conducted by Messrs. DUNSTAN and SHORT. The first step was to contrive a process

for the analysis of the drug, which consisted in exhausting the powdered seeds in an ingeniously contrived apparatus with a mixture of chloroform and alcohol, removing the alkaloids from this mixture as acid sulphates by shaking with dilute sulphuric acid, and then after decomposing with ammonia taking up the liberated alkaloids again with chloroform. When this process was applied to specimens of seeds authenticated as from Bombay, Cochin and Madras, it was found that their richness in alkaloid corresponded with the order in which they are named, ranging in one series from 3·46 per cent. in Bombay to 2·74 in Madras seeds. This variation, which had previously been suspected, having been established, it followed naturally as a corollary that it should be reproduced in the preparations, as indeed appeared in a paper sent by the same authors to the Conference meeting, giving the results of analyses of a dozen commercial specimens of tincture of nux-vomica. In this paper, the authors, availing themselves of the insolubility of strychnine ferrocyanide in dilute sulphuric acid as a means of separating that alkaloid from brucine, were able to show that not only did the proportion of total alkaloid vary, but that there was also a variability in the relative proportions of the strychnine and brucine present. In the results obtained, however, there were signs of another cause of variability in tinctures of nux-vomica, besides the quality of the seeds, which induced the authors to experiment as to the effect of using alcohol of different strengths, and they came to the conclusion, laid before an Evening Meeting last month, that the best results were obtainable in using a mixture of 100 volumes of rectified spirit with 25 of water as a menstruum. Practically the same results were arrived at by Mr. Conroy, who having called attention to the probability after the reading of the first paper, had been working independently on the subject. The use of sodium chloride to assist in the preparation of tincture of nux-vomica seeds had been recommended by Mr. Rother on chemical grounds; but Messrs. Dunstan and Short came to the conclusion that though the exhaustion of the seeds is facilitated by it, which they attribute to a physical and solvent action, the ultimate practical gain is doubtful. In a report upon twelve specimens of extract of nux-vomica the same authors showed that, as was to be expected, the range of variability in total alkaloid and in the relative proportion of strychnine and brucine was quite as great in that preparation, a fact that effectually disposes of the suggestion that the extract might be used as a basis for preparing a uniform tincture.

The bark of *Hymenodictyon excelsum*, which is used in India as a tonic bitter, has been investigated by Mr. Naylor, with the result of disproving the presence of æsculin, which had been alleged, and the isolation of an alkaloid free from oxygen, to which the bitterness appears to be mainly due, which he has represented by the formula $C_{24}H_{40}N_3$ and named "hymenodictyonine," and a peculiar neutral principle. Cusparia bark has yielded to Messrs. Körner and Böhringer three hitherto unknown alkaloids, two of which they have named "cusparine" and "galeipine." Mr. Gerrard has succeeded in obtaining "gelsemine," the characteristic alkaloid of the root of *Gelsemium sempervirens*, in a crystalline form, and as the result of analysis has attributed to it the formula $C_{12}H_{14}NO_2$. Dr. Hay has reported the isolation from *Cannabis indica* of a new alkaloid, which from its physiological properties he has called "tetanocannabin." Theobromine has been found to accompany caffeine in the kola nut by M. Schlagdenhauffen, the compliment being returned, according to Herr Schmidt, by caffeine accompanying theobromine in the cacao nib, where, Dr. Galippe says, it always has copper for a neighbour. Among other contributions to the history of the vegetable bases made during the year may be mentioned the reported isolation of "nigelline" and "connigelline" from the seeds of *Nigella sativa*; of "abrotine," from the common southernwood; of "doundakine," from a West Indian febrifuge bark known as "doundaké," and of "buxinidine," from *Buxus sempervirens*, as well as the formation of an "apo" derivative from colchicine. From oleander leaves Dr. Schmiedeberg has separated one glucoside which he has named "neriin," but which may prove to be identical with digitalein, and another less active that he has called oleandrin, and Mr. H. G. Greenish has given some further information respecting the bitter principles found by him in the allied *Nerium odorum*. Dr. Schmiedeberg has also obtained "apocynin" and "apocynein" from the root of *Apocynum cannabin*, and has pointed out that these, with the oleander glucosides and some other substances, form a group of active principles resembling digitalin in their physiological action, and some of them capable of replacing it with advantage in the treatment of certain forms of heart affection. Neutral principles have also been reported as having been isolated from "manaca" (*Franciscea uniflora*) and "Jamaica dogwood" (*Piscidia erythrina*); and also a camphor from *Lippia mexicana*.

At the February Evening Meeting Messrs. Dunstan and Ransom communicated two interesting papers, which threw light on the action of chlorine upon sodium carbonate in solution, as well as on the constitution of the official liquor sodæ chloratæ, which is generally stated to contain sodium hypochlorite, chloride and bicarbonate. Availing themselves of the observation that hypochlorous acid is soluble in ether, whilst the sodium salt is not, the authors were able to satisfy themselves that during the passage of chlorine gas into a solution of sodium carbonate under the B.P. conditions the sodium hypochlorite at first formed is all decomposed by more chlorine and the final product is a liquid containing free hypochlorous acid, sodium chloride and sodium bicarbonate. If, however, the passage

Pharmaceutical Society of Great Britain.

CATALOGUE

OF

ADDITIONS TO THE LIBRARY,

1883.

(*Note.—Books to which * is affixed are not circulated.*)

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of chlorine be continued beyond this point, the whole of the sodium bicarbonate is decomposed, hypochlorous acid and sodium chloride being formed. In view of this conclusion it was significant that no commercial specimen of liquor sodæ chloratæ examined yielded free hypochlorous acid to ether, but they all gave abundant evidence of the presence of sodium hypochlorite, and the authors therefore concluded that they had been obtained by the decomposition of a solution of bleaching powder with sodium carbonate. Another investigation, reported by Mr. DUNSTAN, had a bearing upon the chemistry of glycerinum and mel boracis, and was a continuation of previous experiments of the author as to the action of some polyhydric alcohols on borax. His observations went to show that when anhydrous glycerol acts upon anhydrous borax, it combines with half the boric anhydride contained in the salt to form an ethereal salt which he terms "glycerol borin," sodium metaborate remaining. This glycerol borin is decomposed by water, with the formation of boric acid, a reaction that explains the acidity of aqueous solutions of borax and glycerine. In the case of mel boracis there appears to be a liberation of boric acid by the action of the dextrose and levulose contained in the honey upon the borax in presence of water, sodium metaborate being also formed in this case.

A most interesting paper on acetic ether was in March read before the North British Branch by Dr. W. I. CLARK; it contained the results of a large amount of experimental work upon the composition, specific gravity and solubility of that compound, so that its value was scarcely diminished by the fact that it was originally undertaken under a misconception as to the Pharmacopœia formula. Once more phosphoric acid has been the subject of a fresh suggestion for its preparation. In a paper read before the Pharmaceutical Association, Professor WENZELL described a process which consisted simply in the oxidation of stick-phosphorus by atmospheric air in the presence of moisture. By far the principal product under these conditions is phosphoric acid; some phosphorous acid, together with ozone, hydrogen peroxide and ammonium nitrate being also formed. Professor RUNYON has since reported that he has used this process on the manufacturing scale with favourable results. The introduction into the German Pharmacopœia of a test for benzoic acid, which in order to secure a product sublimed from the resin was based apparently upon the presence of an accompanying impurity, has given rise to a vast amount of discussion. It was evident that the reduction of potassium permanganate, in which the test consisted, could be effected by other compounds than the one in question, and some interesting experiments made by Mr. DYMOND, a student in the School of Pharmacy, appear to show that the condition is complied with even by a solution of impure urine benzoic acid. A still more interesting observation made by Mr DYMOND is that when benzoic acid prepared from hippuric acid is submitted to sublimation it can be obtained in a form in which in odour, colour and behaviour towards the official tests it exactly resembles benzoic acid extracted by lime from Palembang benzoin. It may be mentioned here that although it has been asserted that the medicinal activity of sublimed benzoic acid depends upon a small quantity of an essential oil volatilized with it, some experiments made with a quantity of this oil by Messrs. GEHE appeared to show that it is practically inert. The nature of the deposits sometimes formed in liquid pharmaceutical preparations has been frequently the subject of speculation, but Mr. CRIPPS has made a praiseworthy attempt to determine their relative importance. The deposits from a number of different tinctures, collected from various sources, were examined, and as a general result it may be stated they were found to consist principally of starch, colouring matter, and other inert substances. Following up the subject of the solubility of calcic hydrate in water at different temperatures, started by Mr. A. C. ABRAHAM, Mr. MABEN has placed on record the results of a number of experiments from which he infers that the temperature of a shop rarely rises above the point at which water will hold in solution the quantity of lime required in the official liquor calcis, and that the explanation of the cases of defective lime water which have been the subject of prosecution is not to be found in that direction. He thinks it more likely to lie in the conditions under which lime intended for the preparation of lime water is kept in stock, since these often favour the production of carbonate. Nevertheless, even with equal parts of hydrate and carbonate Mr. MABEN obtained a lime water containing equal to 0·5 gram of calcic oxide per fluid ounce. A singular error which had crept into the United States Pharmacopœia process for the estimation of hydrocyanic acid, has been pointed out by Mr. CRIPPS, and Mr. SIEBOLD has given reasons for occasionally supplementing the B.P. test by the American one.

In a valuable paper on aromatic spirit of ammonia, read at the Evening Meeting in February, Dr. THRESH described a process which he said yielded a more uniform preparation than the official one. It consisted in distilling the essential oils with the spirit, dissolving the ammonium carbonate and solution of ammonia in the last portion of the distillate with the aid of a moderate heat, and after filtration mixing the two solutions. It was suggested during the discussion that it would be preferable to avoid even this amount of distillation and simply dissolve the essential oils in the spirit. Sweet spirit of nitre was the subject of still another paper, read before the Conference by Mr. A. C. ABRAHAM, in which he suggested a process based on the intervention of calcium nitrate, provided for by the introduction of calcium carbonate instead of copper, as in the official process, which he said

gave a cheap and satisfactory product. Some examinations, made by Mr. W. H. SYMONS, of commercial samples of spirit of nitrous ether, have revealed considerable deviations from the official requirement and suggest that as long as these commercial preparations find favour amongst chemists and druggists, public analysts will not be at loss for a field in which occasionally to display their official activity. The examination of a sample of iodine liniment which emitted a pungent and irritating vapour led Mr. MACEWAN to the conclusion that in its preparation methylated spirit had been used. This opinion received confirmation from other sources and the unpleasant result is considered to be probably due to the formation of iodo-allyl compounds from allyl alcohol present as an impurity in the wood spirit used. Preparations of ferrous iodide have yielded the usual crop of suggestions for their preservation, the principal ones being the addition of a few drops of alcohol immediately after the completion of the combination of the iodide with the iron in the preparation of the solution, the covering of the syrup with a layer of oil, the incorporation of a certain proportion of glucose with the cane sugar in the syrup, and the use of a mixture of glycerine and glucose syrup, which Mr. PERCY WELLS believes is destined one day to supersede cane sugar syrup in pharmacy.

A considerable amount of attention was devoted during the year to preparations having a basis of fat or a mixture of the paraffin hydrocarbons. The subject was treated in a very comprehensive fashion at the Conference Meeting by Mr. WILLMOTT, who gave the results of a large number of experiments, extending over several years, and made with lard, oil and wax and mineral hydrocarbons. He expressed an opinion that the washing of lard, as ordered in the Pharmacopœia, is without advantage if not detrimental, an opinion which was subsequently confirmed in a paper read by Professor REDWOOD. In mixtures of oil and wax he found that substances met with under the name of "white wax" formed an unstable element, yellow unbleached wax yielding much more permanent preparations. He also noticed that some of the mineral hydrocarbons develop a disagreeable odour under certain conditions. At the same meeting the possibility of using sesame oil as a substitute for olive or almond oil was reported upon independently by Messrs. CONROY and MABEN, the general impression conveyed by the papers being that its use in pharmacy will be limited. Mr. MABEN also contributed earlier in the year a valuable paper upon the preparation and composition of nitrate of mercury ointment, in which he pointed out that the omission from the official formula of a statement of the temperature at which the ointment is to be prepared allows of a great variation in the product, which may either be an ointment of elaidate of mercury or an ointment of nitrate of mercury. The disputed question as to the amount of iodine present in cod liver oil has been taken up by Mr. STANFORD, than whom no person could be more competent. Taking the average of six specimens from different sources, he found the mean percentage to be 0·000322, a quantity far below what has been asserted in text books. In fact, Mr. STANFORD said if these statements had been true, cod liver oil would have been one of the richest sources of iodine known. Iodine, however, appears to be present in minute quantities in many other fish besides cod; indeed the herring contains about four times as much. Incidentally, Mr. STANFORD described a very delicate test for iodine in oil. The general subject of the analysis of oils has been dealt with in an able paper by Mr. A. H. ALLEN, and a similar service for turpentine oil has been rendered by Dr. ARMSTRONG. A further examination of croton oil has been made by Mr. H. SENIER, who finds that whilst the portion not soluble in absolute alcohol constitutes the purgative principle, the portion that is soluble in it represents the vesicant property. A suggestion for using this portion of the oil in the preparation of blistering plasters has already been made. With respect to essential oils M. NAUDIN has pointed out that when they are distilled without the application of heat by means of methyl chloride they are extremely delicate in odour and very stable. Mr. WELLS also has made the practical suggestion that the odour and quality of essential oils and distilled waters may be improved and the decomposition of the latter prevented by the addition of a little potassium permanganate to the water before distillation.

From the foregoing it will appear that the past twelve months were very fruitful in respect to the chemical aspects of pharmacy. But a number of other subjects are worthy of mention, being of considerable practical importance, such as the suggestion of Dr. SYMES to use "green" ginger in the preparation of an essence of ginger; the preparation of pomegranate bark described by Mr. SIEBOLD; suggestions for the dispensing of potassium permanganate in pills; the use of gelatine, collodion, and solution of gutta percha in the preparation of external dressings, and of wood wool and sphagnium moss for a similar purpose, as well as Dr. SYMES'S upward filter and Mr. MABEN'S drying closet. Dr. QUINLAN'S suggestion of ensilage as a method of preserving medicinal herbs is worthy of further investigation; but judging from the changes known to take place in hay and other fodder whilst in the silo, it cannot be expected that the product would represent exactly the fresh plant. The recommendation of new remedies has also brought some fresh substances under the manipulation of the pharmacist, amongst which may be mentioned paraldehyd, bismuth salicylate, sodium hippurate, the goose-grass and the mullein with its "spike of gold."

Every year brings fresh evidence as to the importance of the *rôle* played by organisms belonging

to what are usually esteemed to be the lowest forms of life, and it cannot be ignored that not only such industries as brewing, vinegar making, wine fermenting and bread making, but also the practice of medicine, and, consequently, that of pharmacy, have been profoundly affected by the discoveries made in this direction. During the past year it has become more and more probable that such apparently widely separated diseases as cholera, leprosy, phthisis, whooping cough, gonorrhœa and yellow fever are all attributable to the disturbing influence of specific organisms. Consequently, the search for antiseptics continues, and among those brought forward more or less prominently have been mercuric chloride, trichlorphenol, naphthol, salicyl-resorcin-ketone, various antiseptic tows and carbonic anhydride. The interesting observation has been made that the peculiar action of an infusion of jequerity seeds in setting up factitious ophthalmia is also due to the presence of a bacillus, which is capable indeed of producing much more serious results. Further, the demonstration of the existence of organisms in the soil capable of such widely differing operations as the production of various alcoholic fermentations, the formation of nitrates and their decomposition, and the reduction of sulphur compounds, has afforded a glimpse at a subterranean laboratory of which the existence was, until recently, little suspected.

The book market has been as prolific as ever, and many valuable works more or less closely connected with subjects within the scope of pharmacy have been published. In botany, the *magnum opus* has been the 'Genera Plantarum' of Bentham and Hooker, which has been brought to a close after years of persevering work by the authors. Of a more humble sort, but very valuable in its way, is a 'Student's Guide to Structural, Morphological and Physiological Botany,' which Professor Bentley has sent out. Messrs. Van Gorkom and Moens, two well-known authorities upon cinchona cultivation, have both published manuals upon the subject. Professor Flückiger has completed a second edition of his 'Pharmacognosie,' and a want in English literature had been supplied by Mr. H. G. Greenish's able translation of the 'Plant Analysis' of Professor Dragendorff. 'Fownes's Chemistry' has undergone further necessary modification at the hands of its editor, Mr. Watts, whose name it now bears. Mr. Blyth has given us a new work on 'Poisons' and a fresh edition of his 'Analysis of Food.' An entire army of books has resulted from the publication of the new Pharmacopœias for Germany and the United States, including a fresh edition of the celebrated 'Dispensatory.' Even while we write the new 'Year-Book' has come to hand; whilst, least in size, but one of the most welcome to the practical pharmacist, the 'Extra-Official Pharmacopœia' has made its way through a first and well into a second edition during the last half of the year.

The history of no considerable section of the community for a year can be written without having to chronicle the death of good men and true. Among the friends that pharmacy lost during the past year, may be mentioned Mr. William Squire; Mr. John Eliot Howard, who only a few weeks previously to his death had received the Hanbury Medal; Mr. John Henry Atherton, a former member of the Council of the Pharmaceutical Society; Mr. Benjamin Humpage, a former Auditor and an ever-welcome attendant at the annual meetings; as well as Messrs. Hollway, of Cardiff, Mr. Hatrick, of Paisley, Mr. Ralph Davison, of York, and Mr. Duncanson, of Stirling, all of whom had served the Society in the office of Local Secretary. Several of the "Founders" of the Society have also passed away, and a connecting link with its early history has been removed in the widow of Dr. Jonathan Pereira.

We have thus once more endeavoured to weave into a coherent whole the story of the scattered incidents of another year. In doing so we have endeavoured to keep strictly within the limits of pharmaceutical subjects; but much more might have been written without going further afield than the changes which are revolutionizing the alkali industry, the progress of research in pure chemistry and physics, and the application of scientific principles to technical industries. We suspect, however, that the patience of some of our readers has already been sufficiently tried, and we lay down the pen with the wish that the year which is opening may be remarkable for the advancement of the true interests of pharmacy and the prosperity and happiness of all who follow it as a calling.

On Monday evening next, the London Section of the Society of Chemistry will hold a Conference in the rooms of the Chemical Society, Burlington House, to consider and discuss the subjects of the "Desirability of Uniform Methods and Bases of Analysis" and the "Practicability of Establishing an International Agreement concerning them." Representatives from the Chemical Societies, the Pharmaceutical Society, the Society of Public Analysts and other associations have been invited to attend.

* * *

Within the last few days the authorities at the Patent Office have issued, in a pamphlet form, the new rules for the registration of trade marks, with the classification of goods and a table of fees, which will apply under the Patent Act that came into operation on Tuesday last. We propose to supply a *résumé* of the rules in next week's Journal.

* * *

The *soirée* of the Associated Scientific Societies of Liverpool, which has now become an annual event, was held at St. George's Hall, on the 19th ult. It passed off with great *éclat*, more than three thousand ladies and gentlemen having been present.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday next, January 10, at 8 p.m., when a paper on "Hydroxylamine" will be read by Mr. W. H. Ince, and a Report upon Inorganic Chemistry will be made by Mr. Lowe.

Provincial Transactions.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The fifth meeting of the sixth session was held in the Pharmaceutical Society's rooms, 119A, George Street, Edinburgh, on December 26, at 9.15 p.m. Mr. Claude F. Henry, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the President called upon Mr. George Coull to read a paper on some of the "Pharmacopœial Gum-Resins."

Selecting scammony and myrrh as being the most important gum-resins, the essayist gave a very interesting historical account of these drugs. Referring to the collection of scammony, he showed how want of care on the part of peasant collectors tends to lower the value of the product, and that low quality is not only due to carelessness but to intentional adulteration and sophistication. The various adulterants were then mentioned and means for their detection given. After briefly referring to the chemistry of the drug, he proceeded to speak of myrrh on the same lines; a most interesting part of this portion of the paper being that in which he treated of the botanical origin of the varieties of this gum-resin. The paper was well illustrated by diagrams and a full series of specimens.

The President, in moving a vote of thanks to Mr. Coull, said that the paper which had been read was a proof of the good influence of the Association, the writer having been a member for two or three years and one of the Association's prizemen. The paper reflected great credit on Mr. Coull, and was particularly commendable from the fact that he was still an apprentice.

Mr. Joseph Low seconded the motion, which was heartily accorded.

A discussion then took place, in which Messrs. Crowden, Hill, MacEwan and Thomas Stephenson took part.

Several queries were then submitted, and replied to by Messrs. Coull, Hill, Low, Robertson, Thomas Stephenson, Turnbull and others.

The President having intimated that the next meeting would be held early in January, when papers will be read by Messrs. Robbie and Stephenson, apprentice members of the Association, the meeting adjourned.

LIVERPOOL CHEMISTS' ASSOCIATION.

Soap Manufacture and the Soap of Commerce.*

BY ALFRED SMETHAM, F.C.S.

The manufacture of soap, although known in early times, has during the present century reached wider proportions than at any previous period, and has been the study of scientists who, without altering the fundmental principles of the manufacture, have made many improvements in the details. Formerly the term soap was applied to a variety of substances of an oleaginous nature, but it has now become narrowed to those substances used for domestic and industrial purposes for the removal of grease and dirt.

The soaps thus used are classed under two heads—soft and hard. The former is a compound of potash or potash and soda in combination with the fat of a drying oil: but it is simply with the hard soaps that I wish to deal this evening.

Until comparatively recent years the whole of the soaps manufactured were obtained by the action of a solution of soda upon an oil or tallow, sometimes with the addition of rosin; but with increased knowledge and greater competition, various additions have been made which, if not improving the quality, have certainly had the effect of cheapening the production.

* Read at a meeting of the Association, November 8, 1883.

But whether a pure soap or a mixed one be desired, the first proces is the same, viz., the saponification of a fat or as it is technically called the production of curd. To effect this, the fat to be operated upon is placed in large boilers or pans, around which are coiled pipes to conduct steam. The lye, which is solution of caustic soda, is then run in until the whole of the fat is saponified or decomposed. This, then, is the principal operation of soap making and it will be well to consider in what this consists.

Most of the oils and fats used by the manufacturers are complicated organic substances known as glycerides of the fatty acids. This may be more clearly stated, perhaps, by saying that they are a combination of fatty acids with glycerine. In the saponification of a fat the glycerine is displaced by the soda used, and a neutral soda salt formed in its place.

Thus if the fat operated upon were pure stearine we should have the following reaction:—

$$\left.\begin{matrix}(C_{18}H_{35}O)_3\\C_3H_5\end{matrix}\right\}O_3 + 3NaHO = \left.\begin{matrix}C_3H_5\\H_3\end{matrix}\right\}O_3 + \left.\begin{matrix}(C_{18}H_{35}O)_3\\Na_3\end{matrix}\right\}O_3$$

Stearine.

The fats, however, are more complicated, and generally cousist of a mixture of fatty acids such as stearic, oleic and palmatic in combination with glyceryl.

In England the chief ingredient of pure soaps is tallow. This is the fat obtained from sheep and oxen, the quality varying somewhat according to the source. As found in the market it is generally white or of a very light brown colour, contains only traces of moisture, and is practically free from mineral salts. Sometimes, however, the colour is dark and the percentage of water is found to be considerable. Unless it has suffered decomposition it is found to be a mixture of neutral fats, consisting chiefly of stearine and olein.

The fat next in importance to tallow is palm oil. This, as it arrives in this country, is a moderately soft fat, of a bright yellow or orange colour, and generally contaminated with variable proportions of water and dirt. It is, therefore, customary to sell it upon a fixed basis as shown by chemical analysis. Owing to the crude methods of production by the natives a portion of the neutral fats has become decomposed, and fatty acids in appreciable quantities are sometimes met with.

The yellow colour of the oil renders it unfit for use without previous bleaching. This is commonly performed by what is known as the bichromate method—a process which is equally applicable to dark-coloured samples of tallow.

The oil is first melted in a caldron and the dirt allowed to subside. The purified oil is then run off into a second vessel and treated with an aqueous solution of bichromate of potash and an excess of sulphuric and hydrochloric acids or hydrochloric acid alone.

The acid first decomposes the bichromate thus:—

$$K_2Cr_2O_7 + 2HCl = 2KCl + H_2O + 2CrO_3.$$

The chromic acid thus set free is again decomposed by the excess of acid with the formation of chromic chloride and nascent oxygen, the latter of which by oxidation destroys the colouring matter of the oil. The second reaction is principally as follows:—

$$2CrO_3 + 6HCl = Cr_2Cl_6 + 3H_2O + O_3.$$

Although I have expressed the reaction which takes place by two equations so as to render the changes more intelligible, the two decompositions really proceed simultaneously and in one operation. The resulting sesquichloride of chromium and the chloride of potassium are found in the water below, and the bleached oil floats on the surface and can be readily removed.

From the above equations it will be seen that the theoretical proportions are as nearly as possible equal quantities of bichromate and hydrochloric acid; but in practice it is necessary to use a large excess of acid in order to ensure the complete reaction, and acid from two to three times the weight of the bichromate employed is generally used. The acid in these quantities has no de-

trimental effect upon the oil and the exact proportion is, therefore, of no moment.

Besides the two fats already specified a large number of oils are extensively used. Olive oil is commonly employed upon the Continent, but is rarely used in this country. At home cotton seed oil, palm nut oil (a white solid fat, differing widely from palm oil) and cocoa nut oil are most frequently used. When the price is sufficiently low, castor oil and lard, and occasionally other oils, are used in the manufacture.

All these oils are essentially of the constitution before mentioned. The liquid oils are usually rich in olein, whereas palm nut oil and cocoa nut oil are rich in palmitin. On saponification they all yield about one-tenth of their weight of glycerine, which has to be removed by a process to be presently mentioned. This glycerine is now, I believe, being successfully recovered from the spent lyes, and should, at the present prices, leave a wide margin for profits.

Besides the fatty matters, rosin or colophony is employed in the manufacture of yellow soaps. This differs essentially from the fats, and is really a mixture of organic acids known as pinic, sylvic and colophonic acids. These are capable of combining directly with an alkali and forming compounds analogous to those derived from fats, but in the combination no glycerine is formed, and the use of rosin, therefore, reduces the percentage of glycerine in the spent lyes.

The alkali invariably used in the production of hard soap, is, as I have said, soda. In order to decompose the fats it is necessary for it to be in an uncombined or caustic condition, and the presence of even carbonic acid prevents saponification from taking place. The soda used in this country is obtained from common salt by decomposition with sulphuric acid. The sulphate so formed is again treated with coke and chalk and submitted to a high temperature. By this means carbonate of soda is produced which, purified by lixiviation and subsequent evaporation and heating, forms the soda ash of commerce. This it was which until the last few years was sold to the soap-maker, who, after dissolving it, causticized it by the addition of lime. The process was wasteful and required considerable room, which considerations have led to the manufacture of caustic soda by the alkali maker, and the use of soda-ash by soap boilers is now a thing of the past. Some of the largest manufacturers of soap make their own alkali, and thus not only save the profit on the alkali, but also the cost of concentrating the caustic solution, a point of no small consideration when the output is large.

Having now briefly described the raw materials at the disposal of the soap maker, we are in a position to understand the processes which are adopted for their conversion into soap. The boiler first supplies himself with a weak solution of caustic and then melts in a pan a quantity of the fat to be operated upon. The sp. gr. of the lye—as the solution of alkali is called—should not in the first instance exceed 1·050–1·060. The heat is maintained by means of steam, the direct use of a fire being now practically obsolete. The first action of the caustic is to produce an emulsion, and when this is properly formed more alkali is added, the strength of the lye being gradually increased. The reason why a weak lye must be used in the first instance is that soap is insoluble in a strong solution of caustic and the particles of fat would by the use of a strong lye become incased in an insoluble layer of soap which would prevent further action from taking place. The lye is added in until an excess of caustic is found in the pan. More oil or fat, or where required, rosin is then added, and the fat or rosin saturated by subsequent additions of lye. When the operator by examining the texture of the soap considers the reaction complete, the watery solution of soap and glycerine is decomposed by the addition of salt, in a solution of which soap is insoluble. The soap then rises to the surface in a finely divided state, and after complete separation the spent lye is removed. After the removal of the lye the soap is again heated, and if necessary, some weak lye added, so that the soap may assume a "close" texture, as it is called. When this is complete the soap is removed, usually by pumping, to another vessel where it is "crutched." This consists essentially in stirring the mass by rotating arms moved by machinery by which means the soap is brought into condition, and if of too great consistency more water is added. It is now ready for the frames, composed of slabs of wood or iron placed together in a rectangular form, and made in such a manner that when the soap has solidified the sides may be removed. The soap is left in the frames until it is completely set. When this has occurred, the block is taken out and cut into slabs by means of a wire pulled through it in a horizontal direction. The slabs thus formed are placed upon a table with a movable arm across which wires are stretched and the slabs are by this means again divided into bars. It is then, if it be a pure soap, ready for packing. Sometimes, however, it is desired to make up the soap in tablets of given weight. It is then cut up into pieces of the requisite weight and stamped in a press with dyes, the presses usually being worked by hand.

This, then, is a brief outline of the manufacture of a genuine soap; but the exigencies of the case render it necessary to produce a variety of soaps, at cheap prices. This has been brought about by competition and the inability of the public to discriminate between a well-made and a common soap, and consequently it is impossible for any firm manufacturing only pure soaps of high quality to hold its place in the struggle for existence. The cheaper soaps being more readily soluble in water produce a lather more quickly than a pure soap, and as the public does not as a rule make comparative trials as to the lasting powers, and is almost invariably led away by a cheap article, the sale of the best soaps has of late fallen off considerably, and the cheaper kinds have taken their place.

Although I have used the term pure soap to represent a soap manufactured from fat and alkali alone it would be unfair to designate the common soaps adulterated, as we shall see on considering their nature.

A pure tallow soap will only take a certain proportion of water and it becomes necessary to mix other substances with it if the percentage of water is increased. A substance which is useful in this respect, and which at the same time has detergent properties, is silicate of soda. This is the substance known as soluble glass, but it is usually sold to the soap boiler in solution. It is composed of silicic acid and soda in various proportions, and is formed of two kinds, the neutral and the caustic. The neutral has a sp. gr. of about 1·370 and contains about 65 per cent. of water. The proportion of silicic acid is about 26 per cent. and the remainder is soda and impurities. The caustic silicate is a much heavier solution and has a specific gravity of about 1·700. It contains about 43 per cent. of water, 33 per cent. of silicic acid and the remainder alkali and impurities.

These solutions are either used alone, or in combination, and are added to the soap before finishing. It is necessary to "crutch" well to ensure the complete mixing, and the crutching should be continued until the soap is about to set. The silicated soaps generally contain a larger proportion of water than pure soaps, besides the actual weight of silicate, and they can, therefore, be produced at lower prices. The detergent power of these soaps is greater than would be indicated by the pure soap contained in them, and in many districts this variety finds a market more readily than the better qualities. I should here point out that the value of a soap is not altogether determined by the composition. A pure soap may be produced from a discoloured tallow or oil, which as a rule injures the appearance and causes it to command a less value in the market.

A form of silicated soap which obtains a large sale is

the mottled. This differs essentially from the mottled soap manufactured a few years back, which was pure, and necessarily of a high standard. It is usually manufactured from bleached palm oil, or from palm nut oil or cocoa nut oil as the chief ingredient. It is usually run with silicate to a considerable extent and contains a variable amount of fatty acids—the quantity depending on the quality it is desired to make. The mottling is produced generally by the addition of ultramarine, which gives to the soap a bright appearance.

Some samples, sold at low prices, have come under my notice which have not only been run with silicate but contain from 6 to 8 per cent. of common salt and not more than one quarter of their weight of fatty acids. The salt is of no value as a detergent agent, and must be looked upon simply as a "make weight." It is only with soaps made from palm nut and cocoa nut oil that the salt will combine properly. The peculiar behaviour of these two soaps in salt water renders them valuable for marine purposes. Very considerable experience is required in making a soap of low quality which shall be firm to the touch and present the appearances of a good soap, and the difficulty is increased in the case of common mottled soap, where it is necessary to have the mottling equally distributed throughout the mass. The methods by which this is attained are kept, as a rule, as trade secrets, but no great difficulty is experienced when the matter is approached on scientific principles.

In the common soaps which are usually used for scouring, etc., the proportion of soda in excess of the fatty acids may be greater than in those used for finer purposes or for toilet use. The choice of the fat must also be regulated by the purposes to which the soap is intended to be put.

The details of the manufacture require careful attention and can only be mastered after long experience, but it is necessary that all the processes should be carried on in the lines I have indicated. The peculiar behaviour of each kind of soap would occupy more time than is at my disposal: nor would it serve to elucidate the processes; but it is important that the manufacturer should be conversant with their properties. As a rule, the larger the amount of stearin or palmitin there is in the fat operated upon the harder will be the soap.

Before closing the remarks upon the manufacture I may just refer to two methods which are occasionally resorted to, to improve the appearance of common soaps. The first of these consists in placing the soap in an oven or stove so that it may become surface died and present a hard "skin." The second of these consists in dipping the soap in a strong solution of brine or other liquid. The salt has a great affinity for water and removes it from the surface of the soap, but the soap itself is quite insoluble. This process improves the appearance considerably and prevents the soap having a sticky consistency on the exterior of the bar.

In treating of the second part of my subject, it may be well to preface my remarks with a brief account of the methods by which I have arrived at the results which I propose to state, as showing the quality of the soaps found in the market. I have now in my possession upwards of three hundred analyses of soap from different sources, which have been submitted to me at various times. In analysing these I have found the following processes the most convenient and accurate.

The water is determined by drying in an air-bath a weighed portion of the soap at a temperature of 120° C. At this temperature the soap swells up and the water is soon expelled without any loss of the fatty matters or danger of losing the substance. The weight is taken after about three hours, and subsequent weights are made at intervals of about an hour until the weight is constant.

To obtain the percentage of fatty acids I find it best to weigh out about 3 grams of the soap in a porcelain or platinum basin, including in the weight of the basin a small stirring rod about 3 inches long. The soap is then dissolved in a small quantity of water in the basin, and when *completely* dissolved, about 5 c.c. of dilute sulphuric acid are added. This decomposes the soap, setting free the fatty acids and forming sulphate of soda. The solution is then gently warmed—preferably on a water-bath—until the whole of the fatty acids have risen. It is then allowed to cool, and the fatty matter will usually form a solid cake. If this does not occur a weighed quantity of purified wax must be added and the whole re-melted. When the cake is formed it is simply moved a little from the side, and the liquid from below, which should contain no fat, is poured off. The cake is re-melted with distilled water and allowed to settle as before. This is continued until the washings are free from acid. The cake is then melted in a water oven and again allowed to cool, and the water which still adheres is removed by gently touching with filter paper, and the basin is again placed in the water oven and weighed until the weight is constant. From the figures obtained the percentage of fatty and resinous acids is calculated.

The soda is determined by adding to the filtered solution from a given weight of soap an excess of standard acid and titrating back the excess of acid by means of standard alkali, using cochineal as indicator.

The percentage of silicate is obtained from the silicic acid found. To obtain this I prefer to ignite about 2 grams of the soap in a platinum dish until the volatile matters are dispersed. After cooling, the ash is covered with a glass and treated with an excess of hydrochloric acid. It is then evaporated to dryness, taken up with dilute acid, well washed and then ignited and weighed.

These are the constituents which it is usually necessary to determine, but it is sometimes required to make a more complete analysis. When this is desired it is a good plan to dissolve the soap in alcohol and filter. By this means most of the adulterating materials are separated. The chlorine is best estimated after decomposing the soap with nitric acid and allowing the fat to solidify, as in the estimation of fatty acids, by precipitating with nitrate of silver and weighing the resulting chloride.

The percentage of free alkali is important. It can be obtained by precipitating the clear alcoholic solution with carbonic acid, but I prefer to titrate the solution with standard acid, using phenolphthalein as indicator. The results are good.

In making out the analysis of a soap it must be remembered that the fatty constituents actually exist as fatty anhydrides and not as fatty acids, and if, therefore, we determine the whole of the constituents of a soap and include the fatty matters as the estimated acids we shall find that the figures will add up to about 103 per cent. This is due to the absorption of water by the fatty anhydrides in decomposition. The actual percentage of fatty acids should always be placed as a footnote.

In making a choice of the soaps usually found in the market it is difficult to know which to take as representative, but it will perhaps be sufficient to divide them into two classes, the pure and the silicated, and to give a few of the figures which represent the average qualities:—

Pure Soaps.

	Fatty acids.	Soda.	Water.
Golden Crown. . .	59·16	6·81	33·83
Yellow, No. 1. . .	57·17	6·70	35·92
Yellow, No. 2. . .	56·59	6·38	36·89
White	53·74	7·36	36·57
Yellow	62·61	8·26	29·30
Crown	57·85	6·99	33·26
Brown	58·24	6·64	32·80
White	60·01	6·78	32·69
White	63·11	8·31	28·73
Yellow	55·57	8·27	32·13
Yellow	63·18	7·62	28·13
Pale	57·73	6·49	34·95

Silicated Soaps.

	Fatty Acid.	Soda.	Hydrated Silicate of Soda.	Water.
Common mottled . .	26·26	5·30	2·32	58·97
Common mottled . .	26·26	5 69	1·04	58·21
Mottled	43·76	6·94	4·78	45·12
Mottled	45·84	7·03	3·98	43·00
Common crown. . .	36·16	5·59	7·11	54·79
Common brown . . .	32·50	5·55	8·58	56·50
Mottled	56·91	7·45	3·00	31·41

In conclusion I have to tender my thanks to Mr. Briggs, of the firm of Messrs. Tyson, Richmond and Co., of this city, for kindly supplying me with samples descriptive of the various makes, and for the information and personal kindness he has shown in assisting me in the preparation of this paper.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, December 20. Mr. T. S. Dymond, Vice-President, in the chair.

After the minutes of the previous meeting had been read and confirmed, Mr. R. W. Giles read a paper on "The Relations of Pharmacy to Therapeutics," of which the following is an abstract :—

The Relations of Pharmacy to Therapeutics.

BY R. W. GILES.

The state of pharmacy in the past was so far from that which a scientific vocation ought to hold that pharmacists were not thought worthy of authority even in matters strictly pharmaceutical. The opinion of the doctor, who was supposed to be a man of science though not a pharmacist, was preferred to that of the pharmacist, who was supposed (with too much reason) not to be a man of science. Even now, although the improvement in pharmacy during the last generation has been great, pharmacists in the mass do not give proof of scientific qualification. The lowest evidence that could be accepted as proof of proficiency in the sciences collateral to pharmacy is the Major examination certificate of this Society; and the number of those who can offer that assurance is probably less than 10 per cent. of those who are engaged in the practice of pharmacy.*

It is not to be wondered at, therefore, that pharmacy, which ought to be treated as a department of therapeutics, had not in the past and has not even now a recognized place in therapeutical science. Or rather, it should be said, pharmacy has of necessity a place in therapeutics, but pharmacists are not yet privileged to be its exponents.

The relation of pharmacy to therapeutics may be viewed in two aspects, viz.:—

1. That of pharmacy collectively.
2. That of individual pharmacists.

The first of these aspects must materially influence the other.

The duties corresponding to the above classification are clearly distinguishable, and may be broadly stated as—

1. Pharmaceutical research.
2. Practical pharmacy.

1. Pharmaceutical research is necessary to therapeutics; and therefore the duty of prosecuting pharmaceutical research must lie *somewhere*. But no one will assert that any individual pharmacist is under the obligation to devote himself to the unremunerative task of research, although many have spontaneously done so. Research is a corporate obligation, in which pharmacists have a common as distinguished from an individual interest. It should therefore be undertaken by the corporate unit, that is by the Pharmaceutical Society.

But what is pharmaceutical research systematically conducted in the common interests of pharmacy? Practically it is the preparation of materials for the Pharmacopœia, which is the final record and application of all pharmaceutical research. The conclusion arrived at may therefore be stated thus:—It is the duty of the Pharmaceutical Society to prepare materials for compiling the Pharmacopœia. It must do this both in fulfilment of the obligation devolving upon it as the accredited representative of pharmacy, and in justification of the claim which it has urged to be admitted to share in the preparation of those formulæ by which all its members are bound. This essential preliminary operation has never been seriously undertaken before, and has never been satisfactorily performed; and, therefore, whenever a new edition of the Pharmacopœia has been called for, it had to be prepared in haste from such materials as could be casually collected from desultory investigations. This was intelligible when the College of Physicians had to do the best they could without any special fitness for the work, but if pharmacists claim to be consulted on the score of special fitness they must prove their claim by using the best means for accomplishing that work creditably on the pharmaceutical side—and obviously that is only to be done by systematic pharmaceutical research. If this course were followed the Pharmacopœia might perhaps present a more enterprising and less conservative aspect than that described by Dr. Redwood, at Southampton, in these words:—"He had no reason to anticipate that in the new edition changes so considerable as those which appeared in the new edition of the American work would be introduced. One principle acted upon in this country was that it was not justifiable to introduce into the Pharmacopœia new preparations which had not been proved in medical practice." If Dr. Redwood had said "new drugs," instead of "new preparations," his assertion would be less remarkable, but if it be not the business of the Pharmacopœia to introduce new preparations, what claim have pharmacists to share in its compilation?

But the duty of the Society must be left to the deliberations of its Council and to the decision of its members; it is not a proper subject for discussion by its students, to whom this outline is presented as a necessary element of the relation of pharmacy to therapeutics.

2. The duty of individual pharmacists is to qualify themselves by preliminary scientific training and by subsequent conscientious practice for the most effective co-operation with the higher branches of the therapeutical profession. The modes in which this may be done are too numerous for citation here. A more advanced pharmacopœia, in which standardized preparations will probably hold a conspicuous place, will demand more scientific knowledge and greater manipulative skill than heretofore. Medical practice, emancipating itself from empiricism, demands from pharmacy greater exactitude. An era of scientific development cannot be a period of sloth for those who would keep pace with it, and it is only by improved scientific attainments assiduously employed in the conduct of his business that the pharmacist will secure that professional status to which the practice of scientific pharmacy fairly entitles him. When therapeutics has accepted pharmacy as its coadjutor in the common ground of the Pharmacopœia, the relations of the

* The last year's summary represented the number of Majors as a little over 11 per cent. of the number of registered chemists and druggists; but as many of these Majors are not in business on their own account, the total must either be compared with the total of those engaged in pharmacy (principals and assistants) or an abatement must be made from the total of Majors for those who are still acting as assistants.

pharmacist to the professor of therapeutics must necessarily be improved, and the medical practitioner will not scorn to avail himself of the former's chemical science in aid of diagnosis. The happiest results should follow from such co-operation.

The changes in the future development of pharmacy will be great without being either sudden or startling; for they will be changes of *development*. Hitherto the changes have been organic, for they have been effected by legislation, to wit, compulsory examination and restriction (although imperfect) of the practice of pharmacy to qualified pharmacists. These have operated in the continental manner, and have so far tended to assimilate English pharmacy to the continental type. That assimilation will probably proceed no further: the continuance of the revolution will be essentially English, accommodating itself to English notions, aiming at the greatest practical convenience and disregardful of theoretic symmetry. In this way the whole of the pharmacies throughout the country will gradually follow the lead of the best English examples—they will become fewer in number and will shake themselves free from incongruous traffic, which neither needs nor suits a man trained to scientific pursuits. Yet they will not discontinue the traffic in the numerous articles which are accessory to though not strictly included in pure pharmacy; and pharmacists will continue to hold an intermediate place between the trades and the professions, discharging the functions of the one and possessing the recognized qualifications of the other.

As the result of these conditions they will attain to the status which an educated and scientific body must always enjoy; forming an integral part of the profession of therapeutics, occupying, indeed, a lower position therein than the medical members, but though inferior in professional status not necessarily inferior in scientific attainments.

Backed by the *prestige* of a profession that gives assurance of respectable scientific education, the pharmacist will no longer be excluded from asserting whatever scientific standing his personal qualifications enable him to maintain; and the grievance now felt by exceptional men (allusion to which on a former occasion suggested this discourse) will cease when such men cease to be exceptional.

A long discussion followed, in which the Chairman, Secretary, Mr. Joseph Ince and Mr. R. H. Parker took part. After Mr. Giles had replied, Mr. Baily proposed and Mr. Ranken seconded a vote of thanks to Mr. Giles for his interesting and suggestive paper, which was carried unanimously.

The Secretary then read the following note on "Munjeet in Chiretta," by the Reporter on Materia Medica.

Munjeet Stems in Chiretta,

BY WILLIAM ELBORNE,

Assistant Lecturer in Materia Medica and Pharmacy, and Curator of the Materia Medica Museum, Owens College.

About two months since, among other donations to our museum, I received from Messrs. Woolley and Sons an original bundle of a plant labelled "Roots found in Chiretta."

Owing to its being neatly folded and corresponding in size to an original bundle of chiretta, its physical resemblance to the true drug induced me to examine it more closely. On breaking the package open I observed that it consisted essentially of long slender *stems* divested (naturally) of the external bark, with the remains of a few leaves. I also noticed that towards the apices, where the outer bark remained attached, the stems were rendered square, whereas the stems where denuded were distinctly round, about the thickness of a quill, and of a dull red colour.

From these characteristics I readily discerned that the plant was not that of any species of *Ophelia*, and consequently not the false chiretta of Bentley.*

However, on referring to the Professor's paper I came across the following passage:—"Moreover, beyond the case of false packing described by Mr. E. A. Webb,† in which the roots of *Rubia cordifolia*, Linn. (Munjeet), had been *enclosed* in bundles of chiretta, I know of no published case of adulteration or substitution of the true chiretta in this country."

From the red fracture of the stems in question I had already imagined they were those of some species of *Rubia*, and the above remarks afforded me a clue to the matter. Referring to Mr. Webb's paper, I found that my specimen corresponded exactly with his description, with the exception of the roots being altogether absent.

I thereupon submitted a portion to Mr. E. M. Holmes to compare with specimens in the Museum of the Pharmaceutical Society, who referred it to *Rubia cordifolia*; and obtained authentic specimens from Kew, with which they entirely agreed. Thirteen years having elapsed since the case of "false packing" was recorded by Mr. Webb; its re-occurence will, I think, justify its again being brought under notice, lest the falsification be more frequent than brought to light. Previous to stating the essential characters whereby the stems of *R. cordifolia* may be distinguished from the true drug, I might allude to the fact that the plant is extensively cultivated in India on account of its roots, which when grown constitute Indian madder (European or genuine madder being derived from the roots of *R. tinctoria*), forming a very important article of export over the Himalayas to Thibet, where great quantities are consumed in dyeing the garments of the Shamas: consequently, it is not surprising that the Indian cultivators, finding their refuse stems somewhat resemble chiretta in appearance, should endeavour occasionally to turn them to some profitable account.

The following constitute the leading distinguishing characters botanically:—

Rubia corifolia.	*Ophelia chiretta.*
Stem.—Long, trailing, outer bark mainly absent; stems on that account round and of a dull red colour. When the outer bark remains attached (at apex), quadrangular, covered with minutest prickles at the angles. Fracture, red. Pith, absent.	*Stem.* — Erect, smooth. Fracture, white, with shrunken pith.
Leaves. — Lamina about 1 inch in length, obcordolanceolate, five ribbed, ribs armed with prickles; supported on long petioles, arranged in whorls of four at the nodes, the latter very conspicuous.	*Leaves.* — Sessile.

Examined microscopically the internal structure of each is so marked that a glance will suffice to distinguish them. In the section of *R. cordifolia* it will, however, be noticed that the woody tissue is more abundant, permeated with very large vessels, and coloured throughout with red matter.

While writing I have been informed by Mr. F. C. Bird that several more bundles have been discovered in other bales. Chiretta being a drug generally supplied to pharmacists in the cut state, this tends, I imagine, to facilitate small quantities of such impurities escaping notice. The infusion and tincture yielded by *R. cordifolia* are, however, of a port wine colour as compared with those of chiretta, which are sherry-coloured.

In conclusion, I beg to acknowledge the services of the authorities at Kew, and those of Mr. E. M. Holmes, Mr. Kirby, and also of Mr. Hermann Woolley, who first detected the adulteration.

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* *Pharm. Journ.*, [3], v., 481.
† *Pharm. Journ.*, [3], i., 367.

Photographs of sections of *Ophelia chiretta* and *Rubia cordifolia*, as well as specimens of the drugs themselves, were exhibited.

After a short discussion upon this Report, the Secretary reported that the revised rules of the Association had been approved by the Council of the Pharmaceutical Society, and would therefore take effect during the present session.

Parliamentary and Law Proceedings.

Poisoning by Almond Flavouring.

Mr. J. C. Malcolm, the Leeds Borough Coroner, held an inquiry, on Dec. 14, 1883, into the death of Elizabeth Heselwood, who had been an inmate of a private asylum at Acomb, near York, and who returned to her family occasionally. She came home, after several months' absence, under the care of a nurse. All went well until the night of the 14th of December, when Mrs. Heselwood, who had been in unusually high spirits that day, was found dead in bed shortly after twelve o'clock. By her side was a small bottle, which had contained almond flavouring, but which was then empty.

Mr. Stacey, surgeon, who was called in, said that death had been caused by the flavouring, 2 drachms of which would be sufficient to poison a man.

Mr. Heselwood stated that on five or six different occasions his wife had attempted to commit suicide.

The Jury found that the unfortunate lady had committed suicide whilst of unsound mind. They were convinced that every care had been taken of her, and expressed their sympathy with Mr. Heselwood.

The Explosion of a Mixture.

On Wednesday, December 26, 1883, the adjourned inquiry into the circumstances attending the death of William Turley, who died in the Manchester Royal Eye Hospital, whither he had been removed from Warrington, was held before Mr. Sydney Smelt, the City Deputy coroner. It will be remembered that deceased purchased small quantities of aquafortis and quicksilver, which were mixed in one bottle and served to him by Mr. Woods, chemist; that deceased placed the bottle in his breast pocket, and that while walking home the bottle exploded and the contents seriously burnt his eyes and face.

G. Harry Nichol said he was an assistant to Mr. Woods and remembered the deceased coming for the two ingredients named. His master did not say, in reply to a question from the deceased, that the stuff would be all right or safe in the bottle. Mr. Woods had himself cautioned deceased as to the dangerous character of the drugs, but only on the first occasion, when deceased made his first purchase at the shop.

James Forster, a butcher in the employ of Mr. Gill, of Warrington, said he saw the explosion. The cork "flew" out of the bottle, and the contents were blown in the face of the deceased just as he reached his master's shop door. Deceased asked for water, which witness procured, and afterwards assisted him into a neighbouring chemist's shop.

Mr. A. H. Griffiths, house-surgeon at the Manchester Eye Hospital, said if deceased had recovered, one eye would have been blind, and the other injured. From the *post-mortem* examination of the deceased he found that the cause of death was collapse, brought on by diarrhœa, which resulted from ulceration of the bowels, and though the burns might have caused the ulceration he could not tell whether such had been the cause or not. Deceased was not a very strong man.

The Coroner having carefully summed up, the jury retired, and on their return the foreman said they were not satisfied that death had been caused by the burns. They were, however, satisfied that Mr. Woods, the chemist, had been guilty of negligence, but thought a censure from the Coroner would meet the case.

Mr. Smelt said he quite agreed with the jury. No one who had heard the evidence could doubt that Mr. Woods, being a member of the Pharmaceutical Society, had been guilty of negligence in mixing the two ingredients and giving them to the deceased in a corked bottle.

The formal censure having been given, a verdict was entered to the effect that deceased died from collapse caused by ulceration of the bowels.—*Manchester Courier.*

Poisoning by Carbolic Acid.

On Monday, Mr. William Carter, Coroner for East Surrey, held an inquiry at St. Thomas's Hospital, respecting the death of John Thomas Denton, aged 26 years, an auctioneer's clerk, who was to have been married on Christmas morning, but who was discovered in an insensible condition with a bottle labelled "Poison" by his side, while the bride and friends were awaiting his arrival at the church. The deceased afterwards tried to speak, but could not. The bottle was labelled as having come from Messrs. Brooks and Hadwin, surgeons, Waterloo Road, but the writing on the label had been rubbed out. A witness then took the bottle to Brooks and Hadwin's to ascertain what it had contained and was informed that it had contained a poisonous liquid, and Mr. Hadwin advised that the deceased should be taken to the hospital, whither he was conveyed i a cab.

Mr. Arthur Foxwell, house physician, deposed to receiving the deceased on his admission in an unconscious state, breathing stertorously, and with livid features. Witness attempted to administer an antidote, but could not. A bottle was shown to witness, which contained a small portion of carbolic acid. The deceased became worse and died about 2 o'clock the same day from the effects of poison.

Further evidence having been adduced, the Jury returned a verdict of "Suicide while in a state of temporary insanity."—*Times.*

Poisoning by a Patent Medicine.

The Coroner for Central Middlesex, Dr. G. Danford Thomas, held an inquiry on Monday at Paddington, as to the death of William Henry John Heath Shehan, aged seven months, which was alleged to have resulted from the administration of a patent medicine sold as a specific for whooping-cough.

William Francis Heath Shehan, 23, Marylands Road, Paddington, said deceased was his child. It had been brought up by hand owing to the death of its mother, and had been suffering about a month from whooping cough. He had given it a patent medicine called "Holt's specific," as many persons had recommended it, and a child in the same house, aged one year and nine months, was also taking it.

Martha Wilkinson, residing in the same house, said she took charge of the child on the death of its mother. She had given the child five doses of the "specific" altogether, the dose being one teaspoonful every four hours. She gave the doses regularly. On Wednesday night she put the child in its bassinet, and on Thursday morning, about 8 o'clock, she found it dead. She had intended to send for a doctor that morning, as its breath had been short all day on Wednesday. She expected the medicine to make the child sick, and it did so the first dose.

Dr. Finzi, who was sent for shortly before 9 a.m. on Thursday, said the child had been dead about an hour. There were no signs of suffocation. He had made a *post-mortem* examination and found the lungs healthy, but with the air-cells enlarged. There were patches

of inflammation in the stomach and intestines which had been caused before death, which was due to failure of the heart from poisoning by antimony when suffering from whooping cough. He had analysed the specific, and found it contained antimony which would have the effect of creating excessive vomiting, depressing the heart's action, and irritating the stomach and intestines.

The Coroner: Now, taking into consideration the number of doses administered to the child and the quantity taken in each of those doses, do you consider the antimony had any share in causing the death?

Witness: Yes.

The Jury remarked that the Government ought to interpose to prevent the sale of these patent medicines, which were simply poisonous rubbish.

The Coroner concurred, but said under the existing law there was no mode of stopping the sale of these dangerous medicines. Persons could take out patents without being compelled to state the ingredients, which they kept a secret. In France the case was different. The law compelled a statement to be made outside the vessel what the contents consisted of. Such a law was required here to protect the public.

Dr. J. E. Curgenven, Craven Hill Gardens, deposed, in obedience to the coroner's warrant, that he had assisted Dr. Finzi in the *post-mortem*, and corroborated his evidence. There was half a grain of antimony in each dose. The witness added he had seen two children suffering lately from the effects of the same medicine. One had died, and an inquest was held on it; the other had its heart so enfeebled that he had been obliged to administer brandy to it, and it was now recovering. This specific was vended by a lady who kept a confectioner's shop, who did not, he supposed, know the effects of antimony.

The Coroner supposed the "secret" had been handed down to her, as the handbill advertising it said it had been established eighty years.

Dr. Curgenven then described the effects of antimony, and said that the deceased was healthy and well-nourished. There were no traces of disease in the lungs, and it would have lived had it not been for the administration of the antimony. No doubt the death had resulted from the effects of antimony contained in the preparation called "Holt's Whooping-cough Specific."

The Coroner here remarked that on the previous inquest held by him a fortnight since, the proprietress of this "Holt's specific" attended with her solicitor, but made no comments. It was strange, however, that neither of them were present on this occasion.

The Jury, having consulted for some time, returned the following special verdict:—"That the deceased had died from syncope through failure of the heart's action when suffering from whooping-cough; and the said jurors are further of opinion that the said death was accelerated by the administration of antimony contained in a mixture called 'Holt's Specific for Whooping-cough,' and the jurors desire to call the attention of the Home Secretary to the want of protection to the public in the sale of patent medicines, with a view to some legislation restricting the sale of those containing poisons and other dangerous remedies."—*Times.*

BOOKS RECEIVED.

How to Arrest Infectious Diseases. By E. G. Barnes, M.D. London: J. and A. Churchill. 1883. From the Publishers.

Bleaching, Dyeing and Calico-Printing. By J. Gardner, F.I.C., F.C.S. London: J. and A. Churchill. 1884. From the Publishers.

Elements of Pharmacy, Materia Medica and Therapeutics. By W. Whitla, M.D. Second Edition. London: H. Renshaw. 1884. From the Publisher.

Chemistry: General, Medical and Pharmaceutical, including the Chemistry of the U.S. Pharmacopœia. By John Attfield, F.R.S., etc. Tenth Edition, specially Revised by the Author for America. Philadelphia: Henry Lea's, Son and Co. 1883. From the Author.

Year-Book of Pharmacy for 1883. London: J. and A. Churchill. 1883.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Poisonous Properties of Rhododendron Ponticum.

Sir,—On reading the paragraphs in "The Month," in the Journal of December 29, relating to the queried poisonous properties of honey from the flowers of *Rhododendron ponticum*, and of the leaves of the same, I thought, as I was in possession of some facts bearing on the question, I would send them to you. In December, 1882, I was consulted as to the cause of death of some twenty sheep in this neighbourhood, suspected to have been poisoned. I had one of them brought to me entire and removed the paunch, which was much distended. In this I found, besides hay or grass, a considerable quantity of half-chewed leaves which I had no difficulty in identifying as those of the rhododendron. This was then confirmed by finding tracks of the sheep in the snow to a bed of rhododendrons in the park, which showed that they had been bitten and eaten. I was informed that the sheep rolled and staggered about before death, as if drunk. The veterinary surgeon who had charge of the case gave me at the time the medical particulars of the affection and the *post-mortem* appearances. I cannot now state them accurately, but could get them if required. My object is just to place on record what appears to me to be a very clear and decisive case of the poisonous action of *Rhododendron ponticum*, and it is the more important that this should be known, as the planting of this shrub and its hybrids in parks, etc., has much increased of late years.

Bradford. Robt. Parkinson.

"*Justitia.*"—We do not remember having made such a statement. Your proper course would be to apply for the information to the Dean of the medical school you propose to enter.

R. Shenstone.—As to the dispensing of potassium permanganate pills see the references in the index to the last volume of this Journal.

J. A. L.—We have not heard that the work referred to has yet been published; neither are we acquainted with one of the same nature.

Query.—We do not believe there is such a work.

A. Wrighton.—The first of the Cantor Lectures on the Scientific Basis of Cockery was published in the Journal of the Society of Arts for December 29.

Inquirer.—The common sundew (*Drosera rotundifolia*) and other members of the Droseraceæ. See Darwin's 'Insectivorous Plants.'

M. M.—(1) The hypnotic and anodyne action of codeine is relatively slight (see *Pharm. Journ.*, [3], iv., 88). (2) 'Pharmacographia.'

"*Cryptogamic.*"—(1) We do not think the book mentioned alone would quite suffice for the purpose. (2) We are not acquainted with the work.

Inquirer.—A list of the certificates accepted in lieu of the Preliminary examination is published in the Society's Calendar.

J. Straphey.—A candidate for the Minor examination must be of the full age of twenty-one years, and must also have passed the Preliminary examination or an accepted equivalent.

Communications, Letters, etc., have been received from Messrs. Wilkinson, Whitla, Möller, Tyrer, Bennett, Torkington, Harris and Co., Samuel, Druggist.

INTERNATIONAL PHARMACEUTICAL EXHIBITION

VIENNA, 1883.

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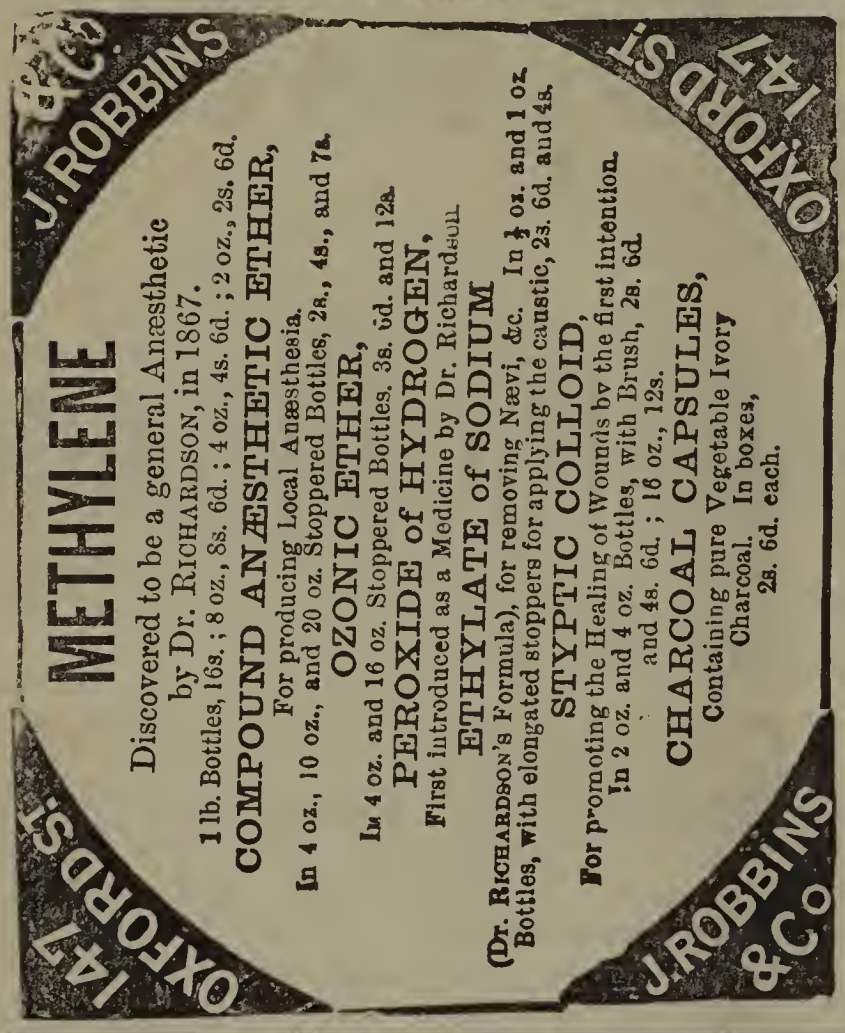

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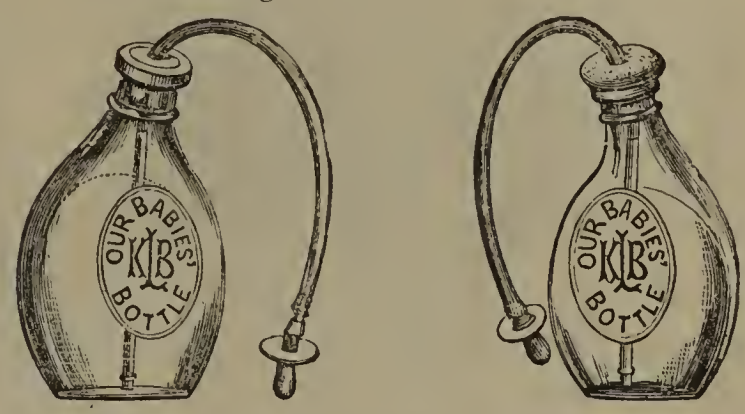

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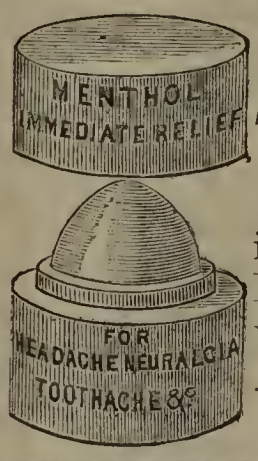

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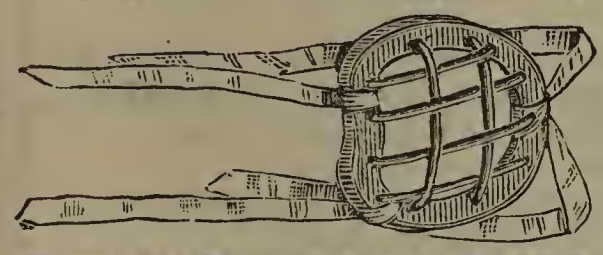

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,, J. Dolbear	,, E. S. Taylor

The following Minor Candidates from this school were successful :—

Mr. W. Burgess	Mr. E. Peck
,, ,, Foster	,, J. H. Shacklock
,, J. T. Jackson	,, R. J. Shannon
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The classes for the February and April examinations have now commenced. For prospectus, &c., apply to

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Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

The Pharmaceutical Department, which was closed for the Christmas Holidays on the 20th December, will be re-opened on the 7th January, 1884.

Entries now begun for the term commencing April 15th.

For Fees, Syllabus, &c., apply to W. Baxter, Secretary.

MAGIC LANTERNS

And Dissolving Views.—Before purchasing see the Patent Pamphengos. B. Malden, Esq., compares it to limelight. The Triplexicon, 3½ double condensers, rack, and pinion, £2 2s. Duplexican, 3½, 30s., most powerful oil light in the world. Magnificent Triples and Biunials, from £6 6s. Hundreds of testimonials. Pamphlet 2d. Photographs 1s. 25,000 slides. Novelties—Coronation of the Czar, War, Captain Webb, Scripture Hymns, Tales. Cheapest and best in the world. Illustrated catalogues, 177 pages, 6d.—Hughes, Brewster House, 82, Mortimer Road, Kingsland, N., London. Second-hand Lanterns, bargains. Great show of slides in the art gallery, a sight to be seen.

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Mr. W. S. TURNER, Pharm. Chem., M.P.S.

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MONDAY, JANUARY 7th,

and will include the Day, Afternoon, and Evening Classes for the Minor and Major examinations which have lately been advertised.

The Class Rooms and Laboratory are so arranged as to accommodate Twelve Students in any one class, and Mr. Turner having succeeded in finding a reliable Assistant, can safely give him the junior men, taking himself the more advanced ones; an arrangement which he thinks will be much to the advantage of ALL the Students, as it will prevent backward men being too much hurried, and advanced ones being retarded by those who are working with them.

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To the April Examination	£5 5s.
To the June ,, ...	£8 8s.
Six Months' Course	£10 10s.
Twelve Months' Course	£15 15s.

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At the Examinations of the Pharmaceutical Society held last month, the following students of this College were successful :—

MAJOR.

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,, T. S. Cornwell. .....Penzance.
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* ,, H. R. Dorning.....Chorley.
* ,, E. H. Taylor.....Tonbridge.
* ,, Richard Brown.....Rochester.
* ,, Walter Jackson.....Catterick.
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AS JUNIOR. Town or country. With good Dispensing and Retail experience. Height 5ft. 8in. Good reference. Carte if required. Moderate salary. CHEMICUS, 66, St. Nicholas St., Aberdeen.

AS MANAGER, LOCUM TENENS, or out door ASSISTANT. Can Extract Teeth. For particulars, apply S. F., 12, Varna Rd., Fulham.

ENGAGEMENTS WANTED.

DISPENSER to a Medical Man or a firm of Surgeons. 16 years' experience. Can be well recommended. Disengaged on the 5th inst. CHLORAL, 15, Brookville Rd., West Kensington, S.W.

AS Junior ASSISTANT. Well recommended by late employer. Age 21. 4 years' experience. H. R. BERINGER, 66, West End, Redruth.

PERMANENCY required. Age 25. 11 years with present employer. Accustomed to country trade. Character open to strict investigation. Competent, but not qualified. Not afraid of work. Please state particulars. CHEMICUS, 37, Regent St., New Swindon, Wilts.

AS ASSISTANT, in a good house of business. 15 years' experience. 7 years in last situation. A permanency desired. H. H. H., 34, St. Thomas St., Weymouth.

HOME, India, or the Colonies. Pharmaceutical Chemist. Age 23½. Height 5ft. 5in. 6½ years' experience. M. P. S., Field House, Chaddesden.

AS ASSISTANT or MANAGER in a good class business. London or suburbs preferred. In or out-door. Age 25. Major qualification. Good testimonials. F. JONES, Royton, Oldham.

A MIDDLE aged, active gentleman (retired from business), finding time to hang heavily, desires MANAGEMENT of a good Dispensing and Family trade. References to London wholesale firms. CHEMIST, 29, Blatchington Rd., West Brighton.

STUDENT preparing for Minor would give 8 hours daily to a Chemist in London in return for board, lodging, and small remuneration. CHEMICUS, 17, Bell Vue Rd., Southampton.

LONDON or large town preferred. As JUNIOR. Age 20. Height 5ft. 6in. 5 years' experience. H. O. JEWELL, 27, Broadway, Hammersmith, London.

AS ASSISTANT. Minor qualification. Good Dispenser. Age 23. A. P. S., care of Mr. Mortlock, Henley-on-Thames.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. Over 30 years' experience, and 12 years' references; with a list of more than 50 former clients forwarded on application.

AS ASSISTANT in a good Dispensing business in town or the suburbs. Out-door preferred. Age 25. C. J. C., 24, Endwell Rd., Brockley, S.E.

DISENGAGED.—As ASSISTANT. Age 24. Tall. In light Retail and Dispensing business. In or near London preferred. With no Sunday work and comfortable home desired. Good references. B., 48, Harmood St., N.W.

AS ASSISTANT, MANAGER of Branch, or DISPENSER to Medical Man. Competent. Good experience. Age 30. Short hours or time for study. A. Z., 98A, Castle St., Reading.

AS ASSISTANT or MANAGER, with a view to purchase or a partnership. Good town and country experience. Ætat. 30. J. WOMEROY, Queen Camel, Ilchester.

AS MANAGER. London or home counties. Age 30. Married. Minor qualification. Registered Dentist. Town and country experience. Permanency only required. J., 2, Wheatsheaf Ter., Leyton.

TEMPORARY. Ætat. 31. By day, week, or month. Town or country. Thoroughly experienced in all branches. Disengaged. Irreproachable references. Terms moderate. A. WOOD, 7, Woodfield Cres., W.

AS ASSISTANT to a Chemist or DISPENSER to a Surgeon. In or near London. Out-door preferred. Time for study in lieu of part salary. Ætat 25. W. K. T., 3, Ferme Park Rd., Stroud Green, N.

ENGAGEMENTS WANTED.

WHOLESALE.—As Wet or Dry COUNTERMAN or WAREHOUSEMAN. Had 2 years' experience in a first-class London Wholesale firm. 10 years in the Retail. J. A. C., Mrs. Bruce, 1, Crawthorn St., Peterboro'.

AS ASSISTANT. Age 27. 11 years' experience. Accustomed to a good class trade. Disengaged. Town or country. X. Y. Z., 9, Shrubbery St., Kidderminster.

MANAGER or out-door ASSISTANT. 16 years' varied experience. Age 33. Height 5ft. 8in. Good references. Can Extract Teeth. C., Mr. Parkes, Chemist, Chapel Ash, Wolverhampton.

AS ASSISTANT. Accustomed to general Retail and Dispensing. A. R., 18, Anglesea Rd., Ipswich.

AS MANAGER or ASSISTANT, out-door. Married. No family. Well up in all branches. No objection to reside on the premises. Good references. X. Y. Z., 8, Lowfield St., Dartford.

MANAGER or otherwise, by a Pharm. Chemist. Many years' experience. R. BAILEY, Broughton, Stockbridge, Hants. N.B.—No engagement less than a week.

AN ASSISTANT, with first-class references, desires situation in London. Age 27. 13 years' experience. Disengaged. D., 19, Kingsmead Sq., Bath.

MANAGER, temporary or otherwise, or out-door ASSISTANT. Single. Qualified. 30. An abstainer. Disengaged. Good Prescriber. Highest references from town and country. ALPHA, G. Moore, Jun., Burgh, Lincs.

AS ASSISTANT. Country preferred. Age 26. 8 years' experience. Usual particulars. T. J. BARTON, 88, George St., Croydon.

AS Junior ASSISTANT. 4 years' experience. Height 5ft. 8½in. Age 20. Tooth Extractor, well up in Dispensing. J. R. WATSON, H. J. Thomas, L.D.S., Landore.

AS Junior ASSISTANT, where one other is kept. Age 22½. 4½ years' experience in good class Dispensing businesses. Good references. MN., 45, Botolph St., Colchester.

WHOLESALE.—In the above. Laboratory preferred. Major qualification. H. S. COLLINS, 38, St. Paul's Rd., Bradford.

AS JUNIOR, in London or suburbs, where two or more are kept. Age 22. Height 5ft. 2in. Moderate salary. Experience required. ALPHA, 2, Bonchurch Rd., Notting Hill, London, W.

IN or out-door ASSISTANT, or to MANAGE. Age 26. Minor qualification. Height 5ft. 8in. Accustomed to good class London business. First-class testimonials. MINOR, 31, Regent Sq., W.C.

TEMPORARY. By day or week. Experienced in all branches. Age 34. Disengaged. W. R. A., 33, Liverpool Rd., N.

ASSISTANT. Age 31. Height 5ft. 4in. 9 years' London experience. Town preferred. E. WINCH, High St., Chesham, Bucks.

AS ASSISTANT, out-door. Married. Age 34. Height 5ft. 7in. Salary moderate. Country preferred. ALPHA, 56. Lamb St., Swansea.

AS ASSISTANT, out-door. Good references and experience. Particulars to BETA, 4, Argyle Ter., Victoria Rd., Scarborough.

MR. HARVEY, Pharmaceutical Chemist, Frome, wishes to recommend a gentlemanly, capable, Christian young man as JUNIOR. Has had 5 years' experience, and desires a situation in February next in a good Dispensing business in London, where he would have an opportunity to attend the Lectures and the Library of the Pharmaceutical Society.

ENGAGEMENTS WANTED.

ASSISTANCY with Chemist, or in Surgeon's Retail. Completed apprenticeship and accustomed to surgery routine. Age 20. Height 5ft. 10in. Town or country. E. H., Mrs. Hamer, Mold Green, Huddersfield.

MANAGER, or as in-door or out-door ASSISTANT. Age 36. Can Prescribe and Extract Teeth. Thoroughly competent. Disengaged. Permanent preferred. London and country experience. ASSOCIATE, 60, Cumberland St., Pimlico.

AS MANAGER or ASSISTANT, out-door. Qualified. Married, no family. Well up in all branches. No objection to reside on the premises. Good references. A. B., Bare Farm, Preston-on-Wye, near Hereford.

AS ASSISTANT. By Feb. 2. Good London experience. London or country. London preferred. Time for study. Age 23. A home appreciated. A. M., 16, Bishop's Rd., Paddington.

AS ASSISTANT in a good class business. Provinces preferred. Good Dispenser. Ætat. 27. Qualified. Disengaged. ALPHA, 28, Borough St., Brighton.

LOCUM TENENS.—A gentleman of long experience in Retail (Pharm. Chemist), desires an engagement to take charge during illness or absence. Most satisfactory references. ALPHA, Williams' Library, Cheltenham.

WHOLESALE.—Either Wet or Dry Counter, or as Under WAREHOUSEMAN. 9 years' experience Wholesale, 5 Retail. Liverpool and London Houses. CHEMICUS, 103, Winston Rd., Stoke Newington, N.

A YOUNG Frenchman, having 5 years' experience in pharmacy, desires an engagement as ASSISTANT. Knows the Spanish language. First-class references. A. H. N., Sandmere Rd., Bedford Rd., Clapham, S.W.

ASSISTANTS WANTED.

APPRENTICE.—A well educated youth as APPRENTICE. A comfortable home and every opportunity for learning the business. Premium moderate. Address, DEVON, care of Messrs. Barron, Harveys & Co., Wholesale Druggists, Giltspur St., London.

APPRENTICE.—In a well established Pharmacy on the South Coast, there occurs a vacancy for an intelligent youth as APPRENTICE with a Pharmaceutical Chemist (by examination). Comfortable home. Moderate premium required. Address, GRESSWELL, The Mile End Pharmacy, Landport.

APPRENTICE.—ROBERT KEEVILL, Pharmaceutical Chemist, York Buildings, Clifton, Bristol, has a vacancy for a well educated youth who has passed the Preliminary examination. The advantages of a first-class pharmacy, with attendance at the lectures of the University College.

W. JERVIS, Broomhill, Sheffield, has a vacancy for a gentlemanly, well educated youth as APPRENTICE, in a first-class Dispensing and Family business.

MESSRS. ARGLES & STONHAM, Maidstone, have a vacancy for a well educated youth as an APPRENTICE.

APPRENTICE, in a light Retail, Prescribing, and Dispensing business in healthy suburb of Cardiff. Premium moderate. One having passed the Preliminary preferred, but not essential. A comfortable home, with time for study, and every facility for acquiring a thorough knowledge of the business. R. K. P., Messrs. Hicks & Co., Wholesale Chemists, Cardiff.

JUNIOR ASSISTANT, for a good class light Retail and Dispensing business. Two kept. Comfortable home. Preference given to a Wesleyan, abstainer, and non-smoker. State salary, &c., to R. & I., care of Barclay & Sons, 95, Farringdon St., London.

ASSISTANTS WANTED.

AN Assistant, by the middle of January. Must have good references. Apply to Penrose & Son, Pharmaceutical Chemists, 5, Amwell St., E.C.

ASSISTANT. Must be a competent Dispenser and accustomed to good class business. Apply, stating full particulars and enclosing carte, Saml. A. Smith, 102, Parade, Leamington.

ST. Pancras, Middlesex.—Dispenser required for the Infirmary at Dartmouth Park Hill. Salary £100 per annum, with dinner daily. Candidates must be Licentiates of the Apothecaries' Company of London, or must have passed the Major or Minor examination of the Pharmaceutical Society of Great Britain. Applications, stating age, accompanied by testimonials of recent date, to be forwarded to me on or before the 14th of January, 1884, and candidates are expected to attend the meeting of the Infirmary Committee to be held at the Vestry Hall, Pancras Rd., at 5 o'clock p.m., on Friday, 18th January, but no travelling or other expenses will be allowed.

Thos. Eccleston Gibb,
Clerk to the Guardians.

Vestry Hall,
Pancras Rd., N.W., 28th Dec., 1883.

WAREHOUSEMAN. Age under 24. Salary £80 per annum. Apply personally to S. Maw, Son & Thompson, 7 to 12, Aldersgate St.

RANDALL & SON, Southampton, seek immediately a Junior Assistant, well grounded in Dispensing and general business. Good personal character. In house. State salary required, age, height, previous experience, &c.

MANAGER, who must be a Registered Chemist and Druggist, for a Chemist and Grocer's business in Cornwall. Good class of trade. Apply, giving full particulars, to H. Gadd. 97, Fore St., Exeter.

QUALIFIED Assistant required to proceed at once to China. Age between 25 and 35. Highest references required. Apply, giving fullest particulars of experience, previous engagements, &c., to Dakin Brothers, 2 & 3, Creechurch Lane, Leadenhall St., E.C.

JUNIOR Assistant, for rough Retail trade in London. One used to horse and cattle medicines preferred. Apply by letter, stating wages required and full particulars, to Thomas Sangster, Veterinary Surgeon, 278, Kennington Park Rd., London, S.E.

IN a London Suburb, an Assistant, about 21, accustomed to Dispensing and light Retail. One requiring time for study and who would not object to assist occasionally in Postal duties preferred. Address L. J., care of Barron & Harveys. Giltspur St., E.C.

ABOUT January 24.—A qualified man of gentlemanly manners, to Manage a small Branch business. Out-door. About 27 years of age. References must be thoroughly good. Apply, stating salary, experience, with carte, to Mr. Arblaster, Chemist, New St., Birmingham. One seeking a permanent situation preferred.

IMMEDIATELY.—In an old-established country business, a good Junior, who has passed the Minor and is well up in Dispensing and first-class Retail. Applicants will please send carte, state age, height, salary required, and references, to Alpha, care of Messrs. Hearon, Squire & Francis, 5, Coleman St., London, E.C.

A JUNIOR, accustomed to Dispensing and good class business. Apply, stating age, salary required and reference, with carte, to Foster & Else, 52, King's Rd., Brighton.

IMMEDIATELY.—A good Junior, of gentlemanly address, steady habits and Christian principles, for a select seaside Dispensing business. Must be a quick and accurate Dispenser, and thoroughly trustworthy. Apply, with carte (to be returned), to F. R. Bessant, 24, Station Rd., Westgate on-Sea.

ASSISTANTS WANTED.

JUNIOR Assistant. In-doors. One who has completed his apprenticeship and passed Preliminary. Must be a neat and accurate Dispenser, and accustomed to the general routine of a light Family trade. Send carte, if possible (to be returned). Apply, stating age, salary required, and references, to John Saville, Pharmaceutical Chemist, York.

FOR February 1st.—An Improver or Turnover, age about 18, for light Retail (suburbs). Must be steady, willing, obliging to customers, and neat in business and person. State age, height, salary (which must be moderate), and all particulars, enclosing carte if possible, to Abstainer, care of Messrs. Barclay & Sons, 95, Farringdon St., London, E.C.

A GENTLEMANLY Assistant (one only employed) for a good class suburban Dispensing business. He must have passed Minor examination and had experience in a good house. Personal application or full particulars, with carte, to H. C. Birch, Upper Norwood, S.E.

IMMEDIATELY.—An Assistant, who has been accustomed to a good class Dispensing business. Apply, with usual particulars, and enclose carte, to J. Dutton & Son, Pharmaceutical Chemists, Rock Ferry, Birkenhead.

IMMEDIATELY.—A gentlemanly Assistant, for a good business in the country. Hours 8 a.m. to 8 p.m. Only those with exceptional references need apply, stating salary required and usual particulars, to Thomas Oldham, Towcester.

ASSISTANT, in a good class country business. One who wanted time for study, comfortable home, and easy hours in lieu of part of salary preferred. Usual particulars to G. Woodhouse, 45, Bull Ring, Ludlow, Salop.

FOR an University business, out-door, a Junior Assistant or Improver. Apply, stating age, height, salary required, with reference, to M. Laxon, Pharmaceutical Chemist, 36, Trinity St., Cambridge.

AT once.—An Assistant, to Manage a Prescribing and Dispensing business. Must be a good Counterman and have first-rate references. Salary 30s. per week, with unfurnished rooms and commission. Apply, personally or by letter, to J. R.. Messrs. Hodgkinson, Stead & Treacher, 198, Upper Whitecross St., London, E.C.

IMMEDIATELY.—A gentlemanly Assistant, not under 24 years of age, who has been accustomed to a first-class Retail and Dispensing business. Apply, stating age, height, salary required, with usual particulars and carte, to J. Clarke, 88, George St., Croydon.

A JUNIOR Assistant or Improver. Apply to Mr. Hindhaugh, 9, Barnsbury Rd., N.

A DISPENSER, with Minor qualification. Apply, with full particulars, to A. B., 4, Colquitt St., Liverpool.

AN Assistant, principally for Dispensing. Must have passed the Minor examination, and write a neat hand. State full particulars, with salary required, J. Colby & Co., 101, Western Rd., Brighton.

MANAGER (permanent), for a West-end house, where three or four are kept. Must be over 30 years of age, and have the Minor qualification. Also an Assistant, about 24. Minor. Address, by letter only, stating experience, to A. B. C., care of Messrs. Sanger & Sons, 489, Oxford St., W.

BY Jan. 28th.—A Junior Assistant, about 22 years of age. Must be well up in Dispensing, a neat writer, and accustomed to good class Retail. Apply, personally if possible, if by letter, enclose carte (to be returned), to Charles Davies, 8, Union Ter., Notting Hill, London.

COMPETENT Assistant, one day weekly, by R. Preston, 100, Fulham Rd., South Kensington, S.W.

ASSISTANTS WANTED.

JUNIOR Assistant.—Immediately. One who has been accustomed to Dispensing. Apply, personally in first instance (between the hours of 3 and 6), F. W. Warren, 8, Neeld Ter., Harrow Rd. (opposite Lock Hospital).

AN Assistant, in a first-class country business Must be of good address, good Dispenser, and have Minor qualification. Apply, stating age, salary required, and full particulars, to J., care of Messrs. Meggeson, Miles Lane, Cannon St., E.C.

JANUARY.—An Assistant, accustomed to Retail counter of first-class country trade. Highest references and good address indispensable. Permanency preferred. State age, height, salary, and usual particulars, enclosing carte, if convenient, to Chave & Jackson, Hereford.

AN Assistant, competent to Manage a medium-class trade. Age from about 23 to 26. Address, with particulars, references, and salary expected, Mr. F. S. Fletcher, 59, Breck Rd., Everton.

FOR Tasmania.—An Assistant, about 24 years of age. Apply, with full particulars, by letter only, to Hooper & Co., 24, Russell St., Covent Garden.

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IN the Suburbs.—Rapidly increasing neighbourhood. Handsome corner shop. Newly fitted and stocked. Yard and stable attached. No opposition. Established 15 months. Rent £40, on long lease. Upper part of house let, bringing in £33 16s. a year. Good reason for selling. Price £280. For full particulars apply to A. B., care of Mr. F. Francis, Chemist, Edgware Rd., W.

GOOD class Dental Practice, in fashionable watering-place, South Coast. Income £500 per annum. Will bear strictest investigation. For particulars address C. G. K., care of Messrs. Lemale & Co., 53, Haymarket, London, S.W.

WALES.—A pretty corner Shop in leading thoroughfare of a populous seaport town. Practically no opposition. Good house. Long lease. Easy terms. A grand opportunity for a young man wishing a start. Address to Owner, care of Messrs. Evans, Sons & Co., Liverpool.

SOUTH.—Handsome corner Shop, beautifully fitted and well stocked, with good class Retail, Dispensing and Prescribing. Profitable and capable of large extension. Bonâ fide purchasers only treated with. Owner taking larger business. Convenient house. Easy lease. Price £320. Rent £40. Possession at once if desired. Address, A.R., Messrs. Hodgkinson & Co., 198, Up. Whitecross St., London, E.C.

YORKSHIRE.—A genuine Retail and Prescribing Business, in a manufacturing town near Leeds. Returns over £600 a year. To be sold at a valuation, £300 to £400. Trial and every investigation allowed. Rent £35, with house and warehouse. Address, Clio, Hirst, Brooke & Hirst, Leeds.

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BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer:—W. Death vacancy. Same hands 27 years. Returning £800. Full prices. Recently neglected. Stands to do £1500. Good class of trade. Unopposed. Reasonable offer. W.C. Corner. Unopposed. Established 70 years. Returns £500. Month's trial allowed. £400. S.E. suburb. Handsomely fitted. Returning £400. Increasing locality. £350, or offer. S.W. Dispensing business. Returning £650. Full prices. Good house. For £550. Another. Splendid chance for beginner. Handsomely fitted in mahogany. Returning, under assistant, £4 weekly. £125, and half can remain. Somerset. Unopposed Family business. Returning £1200. Rent £35. Only £750. Midlands. Unopposed Retail and Agricultural trade. Returning £700. Good house and garden. £350. West. Same hands 35 years. Returning £450. Only £250. Apply, 30, Jewry St., City, close to Fenchurch and Aldgate Stations.

WARWICKSHIRE.—In a small country town, pleasantly situate, with better class residents, a good Dispensing and Family Drug Business. Returns about £1000. Profits large. Good house and garden. Full particulars on application to H. S., Southall Bros. & Barclay, Birmingham.

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CHEAP.—Small Retail Business in Cambridge. Apply, Sturton Bros., Cambridge.

AN old established light Retail and Agricultural Business, in a market town in Wilts. Good house and large garden. Price about £320. Address, X. Y. Z., care of Messrs. Sanger & Sons, 481, Oxford St., W.

IN the best position of a large town.—Light Retail and Dispensing. At full prices. Large corner shop. Established 50 years. Returns average £800. Sell for valuation, without goodwill; or reasonable cash offer entertained. No agents. Principals only replied to. Mr. W. Jones, Clay, Dod & Case, St. Anne St., Liverpool.

GOOD opening for young man.—A small Retail and Prescribing Business. Very profitable. In S.W. district. To be sold cheap. Satisfactory reasons for selling. M. L., care 138, New Rd., Battersea Park, S.W.

SOUTH Coast.—An old established Retail and Prescribing Business. Good position in large business centre. Excellent scope for Dentistry. Satisfactory reasons for disposal. Full particulars on application. Apply, by letter, P. P., care of Messrs. Maw, Son & Co., 12, Aldersgate St., E.C.

BY Private Contract.—An old-established and valuable Family, Dispensing and Agricultural Drug Business. The shop, with warehouse and dwelling-house attached, is situate in one of the best and most populous towns in Lincolnshire. Satisfactory reasons given for disposal. Full particulars from Mr. Edward Burnham, Chymist, Grimsby.

LONDON, E.—Retail and Prescribing Business. Returns last year £371 14s. 6d. Rent £26, on lease. Satisfactory reasons for selling. D. T. T., Messrs. Hearon, Squire & Francis, 5, Coleman St., E.C. No agents.

TO Chemists, Surgeons or Dentists.—At once, in consequence of the illness of the proprietor, a good Family and Dispensing Business. Corner shop, well fitted. Lease 5 years. Terms moderate to a bonâ fide purchaser. Address, M., 63, Camberwell New Rd., S.E.

HENRY GADD,

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EXETER.—The BUSINESS of a Soda Water manufacturer, &c. Returns over £1000. Price for machinery, stock and fixtures, £300.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 707.] SATURDAY, JANUARY 12, 1884. [PRICE FOURPENCE

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Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, February 6th.

The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on February 6th should be forwarded to the Secretary not later than Wednesday, the 30th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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The next MEETING will be held on Wednesday, 16th instant, at half-past Eight o'clock.

Mr. JOHN NESBIT, President of the Branch, in the chair.

The following papers will be read:—

"Salts of Narcotine." By D. B. DOTT, F.R.S.E.

"Preparation of Galazyne, or Artificial Koumiss." By ADAM GIBSON.

"Aqueous Mixtures containing powdered Chlorate of Potash." By JOHN R. HILL.

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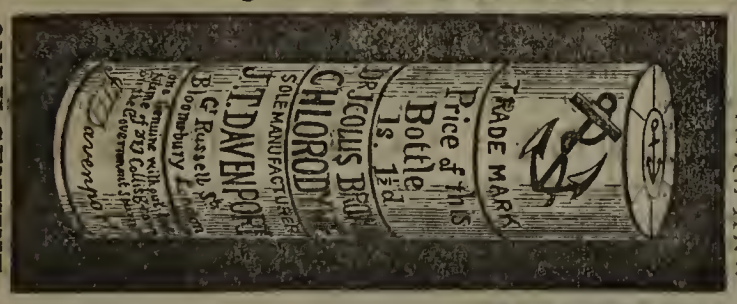

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From SYMES & Co., Pharmaceutical Chemists, Simla. *Jan.* 5, 1880.

To J. T. DAVENPORT, London.

DEAR SIR,—We congratulate you upon the widespread reputation this justly-esteemed medicine has earned for itself all over the East. As a remedy of general utility, we much question whether a better is imported, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances *ad infinitum* of the extraordinary efficacy of DR. COLLIS BROWNE'S CHLORODYNE in Diarrhœa and Dysentery, Spasms, Cramps, Neuralgia the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than Collis Browne's, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than Collis Browne's is a deliberate breach of faith on the part of the chemist to prescriber and patient alike.—We are, Sir, faithfully yours, SYMES & CO., *Members of the Pharm. Society of Great Britain, His Excellency the Viceroy's Chemists.*

DR. J. COLLIS BROWNE'S CHLORODYNE. — Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY to denote which he coined the word CHLORODYNE. Dr. Browne is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE. — Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

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IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

Apothecaries Hall	London.	Gale & Co.	London.	Morson, T., & Son,	London.
Allen, Hanbury & Co.	,,	Giles & Son,	Clifton.	Newbery & Sons,	,,
Baiss Brothers,	,,	Goulding, Messrs.	Cork.	Oldham, G., & Co.	Dublin
Banks & Richards,	Birmingham.	Grattan & Co.	Belfast.	Parsons & Richardson,	Leicester.
Barron, Harveys & Co.	London.	Grimwade, Ridley,	London.	Peake, Allen & Co.	Dublin.
Bell, John & Co.	,,	Grindley & Son,	Chester.	Raimes & Co.	Liverpool.
Corbyn & Co.	,,	Hearon, M'Culloch & Co.	London.	Sank & Barker,	Edinburgh.
Cox & Gould,	,,	Hodgkinson, Tonge & Stead,	,,	Sanger, J., & Sons,	London
Curling & Co.	,,	Hopkins & Williams,	,,	Sim, James, & Co.	Aberdeen
Davy, M'Murdo & Co.	,,	Hovenden, R. & Sons,	,,	Smeeton, W.	Leeds
Drew, Barron & Co.	,,	Johnson, J. H., & S.	Liverpool.	Southall & Co.	Birmingham.
Drew, B., & Alexander,	,,	Langton, W., & Co.	London.	Sutton, W., & Co.	London
Dunn & Company,	,,	Lynch & Co.	,,	Tomlinson, Heyward & Co.	Lincoln
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Foulger, S., & Son	London.	Maw & Son,	,,	Wyleys & Brown,	Coventry
Frazer & Green	Glasgow.	Meggeson & Co.	,,	Yates & Co.	London

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith, unjust to patient and physician. The *value* of the remedy *alone* creates the great demand.

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HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER ..	11/-	Hpr.,	25 bots.
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PULLNA ..	18/-	Case,	20 bots.
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VICHY ..	31/-	,,	50 bots.
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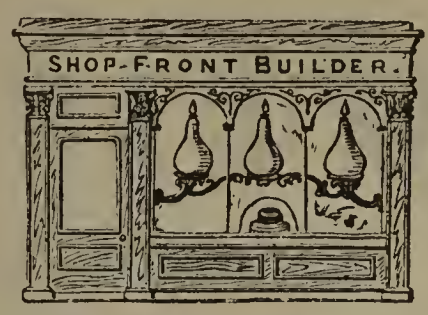

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Owes its great reputation to the happy proportions of its ingredients, which have constituted it an unapproachable and indispensable remedy for Constipation, Indigestion, Obstructions, Piles, Chronic Disorders of the Stomach, Liver and Bowels; Hæmorrhoids, Gravel, Gout, Plethora, Rush of Blood to the Head, Diseases peculiar to Females, Hypochondria, Lassitude, Impurities of the Blood and Skin, Eruptions and Blotches. It improves the appetite, keeps the head clear, the blood cool, but never debilitates. Its efficiency can be proved by the testimony of hundreds of physicians.

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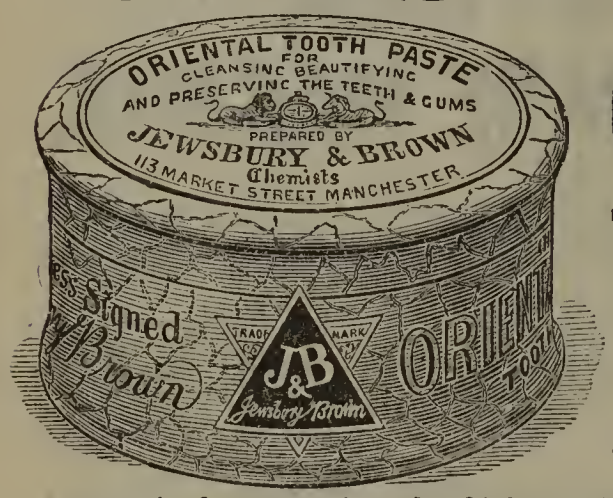

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PURE MINERAL WATERS

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ELECTRO-SILVERED SYPHONS

OF THEIR OWN MANUFACTURE

AT A SMALL ADDITIONAL COST ON THEIR ORDINARY PRICE LIST.

These Syphons are finished in a very SUPERIOR MANNER, and have an ELEGANT APPEARANCE. Suitable for first-class trade.

All Foreign Mineral Waters supplied at 10 per cent. off list price.

PRICE LISTS ON APPLICATION.

Works:—ASCHAM STREET, LONDON, N.W.

TRADE BRIGHTON Hoopers SELTZER MARK

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Per 2s. 6d. doz.

SIX DOZEN CARRIAGE FREE.

Special Terms for Quantity.

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Manufacturers and Importers of Mineral Waters,

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Robinson's Concentrated Waters

(ESTABLISHED 1855).

Numerous complaints have been made to me of the inferior quality of "Concentrated Waters" supplied by several of the Wholesale Drug Houses. I now find it incumbent to state that during the last twenty-five years I have devoted a large portion of my time and attention to the improvement and perfection of these useful preparations, and that I have the satisfaction of knowing that they *now* occupy a more favourable position in the opinion of the Medical Profession and the Trade generally than at any other time. To guard against future disappointment it is necessary to see that each bottle has my protection label over the cork, without which no other is reliable.

Put up in ½lb. and 1lb. Bottles.

TESTIMONIALS.

From the LANCET, *July 15th*, 1882.

"CONCENTRATED WATERS (Robinson's, Pendleton, Manchester).—Among the samples sent to us we find Aq. Anethi, Anisi, Cinnam Ver., Rosæ, and some dozen of others. Diluted with forty parts of water they form the ordinary waters of the Pharmacopœia. They are *excellent in quality*, and will be very useful, especially in country practice."

From the LONDON MEDICAL RECORD, *December 15th*, 1879.

"MR. ROBINSON, of Manchester, has long had a great reputation for his Concentrated Waters, from which can be prepared the ordinary waters for dispensing. We have lately had an opportunity of examining some of the kinds in most general use—Cinnamon Water, Camphor Water, Peppermint Water, Rose and Elder Flower Waters—and it is satisfactory to see that these valuable old preparations continue to maintain and to deserve their place in public favour. Among the host of novelties yearly brought forth there is a liability to overlook these good old standard medicaments. How many of our mothers and grandmothers can testify to the comforting, soothing, and warming effects of a good dose of Peppermint Water. For all dispensing purposes these Concentrated Waters are reliable and excellent preparations."

PREPARED BY THE INVENTOR,

B. ROBINSON { **Manufacturing Chemist, Distiller, and Brewer of British Wines,** } **MANCHESTER.**

London Agents:—Messrs. HEARON, SQUIRE & FRANCIS.

"PURE WATER is only to be obtained from NATURAL SOURCES."

Vide LANCET, July 7, 1883.

The continually accumulating evidence that typhoid, diarrhœa, diphtheria, and the allied zymotic diseases and ailments are chiefly induced by the consumption of the ordinary drinking water supplied in town and country indicates the value to the medical profession of an absolutely pure natural mineral water which can be recommended with confidence for daily use.

APOLLINARIS NATURAL MINERAL WATER completely fulfils these conditions, as has been proved by the repeated examinations by the most illustrious chemists. Its complete freedom from all impurity, and its agreeable, refreshing, and digestive qualities have for many years secured its recognition and employment by the highest medical authorities as a valuable dietetic agent in daily use, and as a therapeutic in illness and during convalescence.

The MEMORANDUM of the LOCAL GOVERNMENT BOARD, July 13, 1883.

"If any taint (however small) of infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of propagating disease."

The DAILY NEWS, July 19, 1883, says:

"London is still supplied with drinking water from open streams exposed to choleraic infection."

ST. JAMES'S GAZETTE, Nov. 15, 1883.

"THE RECENT OUTBREAK OF DIPHTHERIA AT CANTERBURY.—An investigation by the sanitary inspector has revealed the fact that there are upwards of sixty polluted wells in the district in which the cases of disease occurred. In every instance the water was contaminated with sewage and swarmed with living organisms."

The LANCET says, June 30, 1883:

"Water is the great carrier of the infective germs. It is the water to which we must look."

LANCET, September 15, 1883.

"All parts of the Thames are polluted with human sewage. The whole Thames, in fact, is at all times polluted with unoxidised sewage matters."

REPORTS of the LOCAL GOVERNMENT BOARD.

"Of 142 epidemics of typhoid fever observed in various localities, in 125 cases the epidemic had no other determining cause than the use of water containing impurities."

APOLLINARIS NATURAL MINERAL WATER

"THE QUEEN OF TABLE WATERS."

SOLE IMPORTERS: THE APOLLINARIS CO., LIMITED, LONDON.

THE OCCURRENCE OF SUGAR IN TOBACCO.

BY PROFESSOR ATTFIELD, F.R.S.

About a year ago the following questions were put to me, "Does tobacco contain sugar or any similar saccharoid matter? if so, how much?" The subject not previously having come before me I could not definitely reply. Indeed, a search through the literature of tobacco showed that the questions could not satisfactorily be answered at all in the existing state of our knowledge. I therefore proceeded to obtain evidence on the matter by direct chemical investigation. Samples of cut and uncut tobacco were obtained and tested for sugar by the copper test, the fermentation method, and the polariscope. The copper test not yielding concordant results was discarded: it is a good test under most circumstances, but for the quantitative estimation of sugar in tobacco infusions, or, probably in similar vegetable infusions and decoctions, it appears to be untrustworthy. The examination of tobacco infusion by the polariscope will be referred to subsequently.

All the samples readily yielded alcohol when properly fermented with yeast; hence all, presumably, contained sugar, the amount varying from 4 to 9 per cent. But as they were obtained from ordinary trade sources, and as tobacco has been known to have molasses, honey, and other varieties of sugar mixed with it, the samples obviously might contain sugar, and yet sugar not be a natural constituent of tobacco. I therefore proceeded to examine specimens obtained from museums and one which had been raised in my own garden during the previous summer. The latter contained only traces of sugar; but it had been grown in the open, at anything but a tropical temperature, and was not, I think, ordinary Virginian tobacco, but rather the Maryland variety. I may even state, here, that a sample grown in my garden last summer, under better conditions of sunlight, with more care, and from which the flowering tops were frequently nipped off to promote development in the leaves, furnished less than two per cent. of saccharoid matter. Of the other samples some did and some did not afford evidence of the presence of sugar. A specimen of old dark coloured Indian leaf gave no sugar, a light coloured Indian leaf yielded 1·54 per cent., calculated as cane sugar. A bundle of leaves marked "Original sample as drawn from dock at Liverpool," furnished 10·84 per cent. These results being unsatisfactory, for my purpose, I at once asked six or eight of my chemical and pharmaceutical friends, residing in different parts of the great tobacco-producing States of America, namely, Virginia, Kentucky, and North Carolina, to obtain for me authentic samples of genuine tobacco. Each correspondent, kindly, at once, acceded to my request. Neither was in any way connected with the tobacco interest, each resided many miles from the rest, and neither of my friends knew that others were simultaneously collecting samples for me.

While waiting for these authentic samples of American tobacco leaves I ascertained that such precipitants as basic acetate of lead and lime water would remove, from tobacco infusions, alcohol-yielding material, equivalent, on the average, to about 3 per cent. of the tobacco. The saccharoid matter not thus separated may be termed *tobacco sugar*; while this, together with the fermentible matter precipitated by the reagents named, may be termed *total saccharoid matter*.

The samples from the United States duly reached me. They yielded the following results:—

	In 100 parts of tobacco leaf.	
	Tobacco sugar.	Total saccharoid matter.
A	7·00	9·87
B	5·57	8·61
C	7·76	10·94
D	9·60	12·80
E	7·43	10·20
F	9·29	12·40
G	5·57	8·23
H	6·81	10·10
Average	7·38	10·39

The inference is obvious, namely, that tobacco does contain sugar, the amount varying from mere traces, in tobacco grown under conditions not favourable for the production of sugar within the plant, up to nearly 10 per cent., or possibly more, in the light coloured or bright Virginian leaf. I say that, bearing in mind the origin and the results of the analyses of these specimens, their sugar, or fermentible saccharoid matter, is natural; unless we make the absurd assumption that amongst tobacco growers there exists a secret yet apparently universally enforced convention for saturating tobacco plants with a solution of a special and elsewhere unknown variety of sugar.

In cases of suspected sophistication the fermentation method of analysis would probably be adopted, and then as much as 13 per cent. of natural saccharoid matter, or possibly more, might be obtained from tobacco. I myself have examined a large number of commercial samples of tobacco, both uncut leaf and cut, in the form especially of cigarettes, and I have obtained by this method percentages of saccharoid matter varying from 4 to 12½. Even a specimen of a popular dark coloured tobacco, specially fermented to develop highly prized odours and flavours, but which, as chemists would expect, had probably lost much of its sugar during the process, yielded 3 per cent. of tobacco sugar and 5¼ per cent. of total saccharoid matter. It will be seen that the greatest yield of sugar from the trade samples is less than the maximum from my standard samples of genuine tobacco. The average yields of the two sets were very close, both being very near to 10½ per cent. The results indicated, therefore, that the trade samples did not contain added sugar.

If a sample of tobacco contained added sugar its percentage of matter soluble in water would also be raised, and the proportion of matter insoluble in water *pro tanto* be reduced. My authentic samples yielded from 32 to 37½ per cent. of insoluble matter, the average being 35·7. One set of commercial samples yielded an average of 35·9 per cent. of insoluble matter; the assumption of any systematic sophistication of these by sugar was, therefore, again negatived.

The sugar in tobacco appears to possess little, if any, action on polarized light. Such a fact would be of considerable importance in any examination of tobacco infusion for added sugar,—sucrose, glucose, lactose, etc.,—which all exert well-marked dextro-rotatory or lævo-rotatory power on polarized light. The commercial samples of tobacco I have myself recently examined, with scarcely an exception, yielded infusions which, even when colourless, did not perceptibly affect a polarized ray; therefore, with a bare exception they were unadulterated by sugar. Certainly samples

forwarded to me by officials of the Customs in London, at the request of owners, did not contain added sugar. But the fact has, also, theoretical importance, for the existence of a *tabacose*, as we may term it, if it is a true sugar, having such properties, would point to the existence of a sub-class of fermentible but non-rotatory sugars. Possibly, however, the action of this fermentible substance on a polarized ray is only masked.

The isolation and complete chemical and physical investigation of the saccharoid principle or principles in tobacco remain to be accomplished. I should myself proceed with this work, but am assured by a friend that he has already commenced and intends to complete and to publish the results of such a research.

I have to thank the following gentleman for supplying me with specimens:—Mr. T. Roberts Baker, Richmond, Virginia; Mr. C. Lewis Diehl, Louisville, Kentucky; Mr. Marshall C. Hall, Fredericksburg; Mr. F. H. Masi, Norfolk, Virginia; Messrs. Charles F. Tag and Son, New York; two friends in Danville and Lynchburg; Mr. E. M. Holmes,; and the representatives in England of Messrs. Goodwin and Co., Messrs. Allen and Ginter and Messrs. Kimball and Co. Messrs. Stillwell and Gladding have also been good enough to furnish me with information respecting the non-saccharoid principles of tobacco.

CANADIAN INDIAN REMEDIES.

In the course of a lecture on Canada and its Products, delivered by the Marquis of Lorne before the Society of Arts on the 19th ult., he said:—

"Much is said of the knowledge possessed by the squaws of simples; it is certain that they are very clever in producing decoctions and in making poultices from various trees and shrubs whose healing properties are well known to science. Thus, from the bark of a certain species of willow, a preparation can be made which stanches hemorrhage, and quickly heals a wound. Strange tales were told us of the efficacy of some of their medicines. A gentleman employed in botanical research was puzzled by an application made to a slight wound he had sustained; he had, when shooting, hurt his thumb by the accidental discharge of his gun, and for some days, having nothing but water with which to bathe it, he was in considerable pain, and the thumb became much inflamed. Lighting one day, in the course of his march, on a camp of Sioux Indians, one of the women observed his hurt; she came to him and gave him a milk-like liquid, and told to apply this when he felt pain; he did so, and from the first application the pain ceased, and in a few days a very complete cure was effected. A sergeant in the Mounted Police was an eye-witness of the effects of an opiate given to a man, for whom the ordinary remedies of opium, laudanum, and chlorodyne had proved useless. It was evident that the medicine man had some good stuff, although it was equally certain that he employed a great deal of what is known as *hocus pocus* in applying it. He asked for a vessel, and after a time poured into it a white liquid he had concocted. He then covered this vessel over with a skin, pierced holes in the covering, rolled up some pellets of buffalo hair in his hand, muttered some pretended incantations, and dropped these balls of hair through the skin into the liquid. After a while, the covering was removed, and it was seen that the vessel held no longer a white but a red liquor. This, with an amount of faith which one does not often find in a sick patient, was drained by the invalid, and a sound sleep, which was the beginning of a perfect recovery from the illness, appeared to be the result. There may be something worth discovering in the application made by the Indians of certain herbs; but it is to be noticed that the roots and plants hitherto found in the medicine man's lodge have, as a rule, been plants whose properties are already well known to science."

THE SALE OF POISONS IN IRELAND.—DEPUTATION TO THE CHIEF SECRETARY.

On Tuesday last a deputation from the Pharmaceutical Society of Ireland waited on the Chief Secretary, at the Castle, to draw attention to some of the defects in the Pharmacy Act of 1875, and to suggest certain amendments. The deputation consisted of Messrs. James E. Brunker, M.A., President; Harry Napier Draper, F.C.S., Vice-President; Drs. Allen, Collins, Grindley, Hayes, Hodgson, Montgomery, and Mr. Simpson. Mr. Hugh James Fennell, Registrar to the Society, accompanied the deputation.

Mr. Brunker said the object of the deputation in waiting on the Chief Secretary was to call his attention to the state of the law regulating the sale of poisons in Ireland. In the greater part of Ireland, at present, the Sale of Poisons Act was a dead letter. In small country towns and villages they were sold by hucksters, stationers, ironmongers, grocers and others. In England, up to the passing of the Act of 1868, there had been absolutely free trade in the sale of poisons and medicines. When that Act was passed it was provided that persons who at the time were actually carrying on business in that way should be allowed to continue it, but that they should be registered—without any qualification. In Ireland the position of chemist and druggist was different. Until the passing of the Act of 1875 they had the right of retailing poisons, but had not the right to compound medicines. Such chemists and druggists as were in existence at the time were allowed to continue in business. They were obliged to pass an examination but were not obliged to register. By section 31 of the Act such persons had reserved to them the right to continue to sell poisons without any examination, but no machinery was adopted whereby such persons should be registered. The Pharmaceutical Society had no power to register them—they did not know who they were; and others, besides those in business in 1875, were cropping up every day. For the protection of society, it was desirable that there should be a power given to them of registering those persons. The question was whether such a grade of men should be allowed to continue. There was some difference of opinion, but the Council, by a majority, thought that it would be in the interest of the public that in future all persons should be licensed to sell poisons only on passing a moderate examination. These it was proposed to call "registered druggists."

The Chief Secretary: Would the registered druggist be allowed to compound medicines?

Mr. Brunker said he would not. They felt, however, that at the rate at which men were coming up to them at the present time it would be many years before they could supply the wants of the public in small towns and country villages. The Council also recommended that patent medicines containing poison should have that fact and the amount of the poison printed on the label or wrapper. They also desired certain words in the Act to be made more specific to prevent what at present existed—namely, that a qualified man and an unqualified man could carry on business jointly, while, of course, an unqualified man could not carry on business alone.

The Chief Secretary: Before the passing of the Act of 1875, no one could compound medicines in Ireland except apothecaries.

Dr. Collins said that in England up to 1868, any man was at liberty to compound medicines. They generally served an apprenticeship, but there was no law requiring them to do so. In Ireland, for centuries, the compounding of medicines was confined to licentiates of the Apothecaries' Hall. In 1830 the various medical colleges found it necessary to extend their curriculum.

The Chief Secretary: Do I understand you to say that before 1875 there was no shop in Dublin where medicines could be compounded, except at an apothecary's?

Dr. Collins: There was not legally. There were a considerable number of persons who acted illegally, and

we were obliged to prosecute them. The Pharmaceutical Society, while considering that it would be undesirable to have two grades of pharmaceutical chemists, yet recognized the inconvenience it would be for farmers to have to send a great distance for cattle and other medicines.

The Chief Secretary: Do you propose registration of these in business at the date of the Act or those now in business?

Dr. Collins said they considered the registration should date from 1875, as a large number of persons had sprung up since then who had no real knowledge.

The Chief Secretary: How many licentiates of the Pharmaceutical Society are there at present?

Mr. Brunker: Two hundred and forty.

The Chief Secretary: Of these how many are pharmaceutical chemists, and how many apothecaries?

Dr. Collins said all these had passed the examinatiou, but they had located themselves in the large towns: they would not go to the small places.

The Chief Secretary: What is the average number of certificates yearly?

Mr. Brunker: The year before last it was fifteen; last year it was nineteen. This year it is somewhat more.

The Chief Secretary: Where, then, does the main supply of medicines come from?

Mr. Brunker: From the old apothecaries who are rapidly dying out.

The Chief Secretary: Are you disappointed with the results of the Act of 1875?

Dr. Collins said that the first year was a year of grace. They allowed all chemists and druggists who could pass a reasonable examination to come up for examination. They had now a literary examination, and four years' apprenticeship, and then a final medical examination. He expected that after a few years a larger number of young men would present themselves.

The Chief Secretary: Are there a large number of young men serving as apprentices?

Mr. Brunker said that about three hundred had passed the preliminary examination. In answer to the Chief Secretary's question he would say that they were very much disappointed with the results of the Act. He thought this was very much to be accounted for by the want of technical schools in Ireland.

Dr. Collins: Three hundred and twenty-one young men had actually passed the preliminary examination. Only sixty-four out of these had yet passed the final examination.

The Chief Secretary: Is the literary examination at the commencement?

Dr. Collins: It is. We made that a *sine quâ non*.

The Chief Secretary: Would the registered druggists be able to sell patent medicines?

Mr. Brunker said that at present there was no restriction on the sale of patent medicines either in England or Ireland.

The Chief Secretary: Is the sale of patent medicines greater in Ireland than in England?

Mr. Brunker: No; very much less. The lower classes are almost entirely supplied with medicines from the dispensary medical officer. The Irish people, too, are not the medicine-taking people that the people of England are. As a rule the Irish people only take medicine on prescription.

The Chief Secretary asked what was the practical state of things in England?

Mr. Brunker said that in England every village almost had its qualified man. There was a glut of qualified men, whereas in Ireland there was a paucity.

The Chief Secretary said that what the deputation had put before him presented itself undoubtedly in a very reasonable form. If once, however, the question of amending the Act was started, there might be proposals from other quarters, and it might save time if other matters that might lead to controversy should be discussed also beforehand. With regard to the Bill of 1875—by whom was it introduced?

Mr. Brunker: By the Government.

The Chief Secretary: From the first?

Mr. Brunker: From the first.

The Chief Secretary said he had heard their representations with the greatest respect, and he should not hesitate to speak out if from the information that they had laid before him he saw any decided objection to the amendments they proposed. He could, however, do very little more than recognize the force of their arguments, and promise, unless he heard any counter-arguments which might appear of sufficient weight, to do all in his power to meet their wishes. There would be, no doubt, sufficient publicity given to what had passed in that room to-day to enable any counter statements to be brought forward, and these he should consider as carefully as he had heard their statement that day. It was quite impossible to bring forward any opposed bill on Irish matters early in the session with any chance whatever of its passing, because in the first place there would, no doubt, be important Government measures not relating to Ireland brought forward, and one could hardly hope that these would pass without a certain amount of controversy; and, in the next place, undoubtedly he had pledged the Irish Government, as far as a pledge could be given, to one or two measures—to one which would undoubtedly be opposed—he referred to the Sunday Closing Bill—and to another which, if not opposed, would at all events give rise to a good deal of comment and interesting debate. If, therefore, there was any serious opposition to this measure, he could not give a promise of its being carried at an early period of the session. There would, therefore, be plenty of time for them to consider the matter, to look for the minor details, and for those who might be opposed to it to bring their arguments against it.

The deputation then retired.

THE PUBLIC PRESS ON THE SALE OF PATENT MEDICINES CONTAINING POISONS.

From the British Medical Journal, *Jan. 5.*

. . . "Whatever good may result from the occasional use of quack remedies—and it is probable that good does occasionally arise from their use—the indiscriminate taking of secret nostrums by an ignorant public, for all sorts of purposes, is a most pernicious habit. We have been led to make these remarks . . . for the purpose of drawing attention to an inquest, held by the Coroner for Central Middlesex, reported in the daily papers of January 1. A child, seven months of age, and brought up by hand, was suffering from whooping-cough. For its relief 'Holt's specific' for that disease, formerly called 'Hooper's,' was given in teaspoonful doses every four hours. After the fifth dose the child succumbed, and no wonder, for, according to the evidence of Mr. Finzi, who made a necropsy and an analysis of the medicine, each dose of this contained half a grain of tartar emetic. There were patches of inflammation in the stomach and intestines, and death was due to failure of the heart, from poisoning by antimony, when suffering from whooping-cough. The jury, on this evidence, remarked that the Government ought to interpose to prevent the sale of these medicines, which were simply poisonous rubbish. The coroner stated that under the existing law there was no mode of stopping the sale of these dangerous medicines. Mr. Curgenven also gave evidence to the effect that he had seen two children suffering, lately, from the effects of the same medicine; one had died, and an inquest had been held, and the other had a narrow escape. The deadly 'specific' was vended by a woman

who kept a confectioner's shop. The jury returned the following verdict:—'That the deceased had died from syncope through failure of the heart's action, when suffering from whooping-cough; and the said jurors are further of opinion that the said death was accelerated by the administration of antimony contained in a mixture called 'Holt's specific for whooping-cough,' and the jurors desire to call the attention of the Home Secretary to the want of protection to the public, in the sale of patent medicines, with a view to some legislation restricting the sale of those containing poisons and other dangerous remedies.' Speaking with some knowledge of these patent medicines, we have no hesitation in stating that we believe there is annually a large loss of life from their use. No inconsiderable number of these containing tartar emetic as a constituent. We have now before us a pink powder nearly entirely composed of tartar emetic, advertised and sold as a cure for dipsomania. Its use for this purpose must be attended with extreme danger."

From the Morning Post, *Jan.* 3.

"Patent medicines sold by confectioners and grocers, and swallowed by persons of all ages and constitutions, should, as their most essential characteristic, be perfectly harmless; indeed, looking at the sad results frequently ensuing from these preparations, it must appear that the nearer these ingredients approach the famous bread pill and coloured water draught the better for those who take them. With culpable recklessness, however, powerful and even poisonous drugs are at present employed in patent mixtures, whose effects too often supply occasion for coroners' inquests. An instance of this kind has just occurred in Paddington, where an infant died in twenty-four hours from irritant poisoning, produced by a much-advertised 'specific for whooping-cough.' The medicine was purchased from a small sweet shop and administered in due quantities and at the prescribed times, but five doses proved sufficient to end the existence of a child after intense suffering. Medical testimony attributed the death to antimony, and analysis of the 'specific' showed that each dose contained ½ a grain of that poison. It was stated that an inquest uuder precisely similar circumstances was held in the same district a fortnight ago, whilst numerous cases have occurred there of children rescued with difficulty from the fatal effects of the same potion. In returning a special verdict the jury stated their desire to call the attention of the Home Secretary to the want of protection afforded to the public in the sale of patent medicines, with a view to legislation forbidding the sale of those containing dangerous ingredients. It is matter for regret that the Patents Act, which has just come into operation, contains no provision dealing with this matter; but it is to be hoped the omission will be remedied and the patentees of medicinal specifics be no longer permitted to manufacture poisonous preparations of which the contents are undisclosed, and scatter them broadcast amongst the community with apparently entire irresponsibility. The plan adopted in France of requiring those who obtain patents for medicines to make a statement of the materials to be used; and, further, to declare on each vial or packet the nature of the contents might advantageously be adopted in this country, but would not meet the entire difficulty. Much of the peril and harm arises from the increasing practice of selling these drugs in conjunction with groceries and confectionery by shopkeepers as utterly unacquainted with the names and properties of chemical substances as their most ignorant customers. In vain would the significant word antimony be inscribed on the remedy for whooping-cough, or the deleterious compounds of various favoured narcotics for adults be openly proclaimed, and the only true protection for the public consists in depriving this class of persons of the right of selling them. Anything in the nature of drugs should be procurable only from chemists, whose knowledge and discretion would guide them in dispensing, and they should be made acquainted with the materials entering into the composition of the patent medicines which they sell. All these preparations cannot be classified as deleterious or worthless. Many are prepared from the prescriptions of men of high medical attainments. Others have stood the test of public trial for a great number of years. Without exception, however, the good, bad, and indifferent, down to the penny packets of vermin killer, should be swept from the shelves of ordinary tradesmen. When chemists become their sole legal vendors there will be a perceptible decrease both in the number of lives accidentally sacrificed and of those purposely destroyed through the agency of these preparations."

From the Kensington News, *Jan.* 5.

"A case of poisoning at Shepherd's Bush by hydrochloric acid, another case at Chelsea of poisoning by lobelia, and two recent cases of dog-poisoning, again draw our attention to the scandalous manner in which poisonous substances are permitted to be sold. It would be ridiculous to attempt to prohibit the sale of poisons; they are constantly employed in the arts and manufactures, as components in patent medicines, and as ingredients in rat-killers and the like. But the regulations under which they are sold are stupidly insufficient. The kind of shop at which the poison is bought ought to make no difference whatever; and it is quite immaterial whether it is sold as such, or as an ingredient in a mixture, paste, or other compound. So long as the quantity sold is sufficient to kill, the same measures ought to be required as if it had been bought from a chemist, and in a separate and undisguised form. Cyanide of potassium, for instance, is composed of potass and prussic acid. A chemist is not permitted to sell it except under certain provisions, but anyone who chooses can obtain it at a photographic material shop without question asked or answered. Hydrochloric acid, again, is a strongly corrosive substance, and, because of its smell and taste, no rational person would be likely to take it in mistake for medicine; but it is used for cleaning metals because of its very corrosiveness, and it would be as much out of the question to stop its sale, as it would be to put an embargo on photography by prohibiting the sale of cyanide of potassium. Green copperas, again, and most other disinfectants, are poisonous; but no sane man would think of arresting its sale, any more than arresting the sale of the powders used for making sheep-wash, or of creasote, carbolic acid, or other poisonous chemicals. Rat poisons, whether strychnine or phosphorus paste, and patent medicines, are in the same category. Indeed, an overdose of any active medicine—of one, for instance, containing antimony, mercury, arsenic, elaterium, digitalis, lobelia—is, naturally, likely to be followed by dangerous results, which may also supervene from mistaking a liniment or a lotion for a medicament intended for internal administration. But for all these there is one simple rule. Wherever a poisonous quantity is sold, caution should be exercised, a proper label affixed, and a record of the sale made. Until this simple rule is put in force, we shall continue to hear of constant accidental and intentional poisonings. A chemist, moreover, and not a grocer or the keeper of an oil shop, is the proper person to dispense poisonous articles of commerce. And whoever buys poisons, it should be made penal not to keep them out of reach. Traps, moreover, are the best things for rats, which do not then go and die in their holes, leaving a stench which may last for months."

The Pharmaceutical Journal.

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Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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REGISTRATION OF TRADE MARKS.

ABOUT six months since, whilst the "Patents, Designs and Trades Marks Bill" was still before Parliament, we gave a brief sketch of its principal provisions, and especially of the part relating to the registration of trade marks. The Bill, which soon afterwards passed, came into operation on Tuesday week last, supplemented by certain regulations as to qualification, forms, fees, etc., for the drawing up of which by the Board of Trade provision had been made. We think, therefore, the occasion a convenient one for laying before our readers, who, many of them, are, or may become, interested in the subject of trade marks, a brief outline of the new law and rules upon the subject, describing the steps necessary to be taken under ordinary circumstances to effect registration of a trade mark. In doing so we shall have to repeat to some extent what was said whilst most of the provisions of the Act were still under legislative consideration, but this will be indispensable to a lucid description. There are some special provisions as to the registration of trade marks in use before the 13th of August, 1875, but we shall confine our remarks to those relating to the registration of new marks.

According to the new Act, the "Patent Office," which term is inclusive of the offices for both the granting of patents and the registration of trade marks, is to be under the immediate control of an officer called the "Comptroller-General of Patents, Designs and Trade Marks," acting under the superintendence and directions of the Board of Trade. It is to this officer that applications for the registration of trade marks have to be made, either directly or through an agent, by persons claiming them. Each application has to be made on a prescribed form,—not, however, that printed in the Schedule to the Act, but one substituted for it by the Rules,—which must be left at, or sent by post to, the Patent Office, accompanied in the case of marks relating to cotton, linen, jute and silk goods by four and in all other cases by three representations of the mark, one on the form of application itself and the others on separate half sheets of paper. It may be here convenient to state that, subject to other instructions from the Comptroller, all applications, notices, etc., have to be on durable foolscap paper, 13 inches by 8 inches, with a margin on the left hand side of not less than an inch and a half, and that all the authorized forms are now included in the Rules, which are purchasable at the Patent Office for sixpence. In virtue of powers conferred by the Act the Board of Trade has divided goods, for the purpose of registration, into classes, which are practically the same as those adopted under the Act of 1875. A trade mark must be registered for particular goods or classes of goods, and only goods contained in one and the same class should be set out in the same application, a separate application being required for each separate class. The fee payable on each application to register a trade mark for one or more articles included in one class is five shillings. The receipt of an application is to be acknowledged by the Comptroller, who may, however, if he thinks fit, refuse to accede to the request to register, the refusal being subject to an appeal to the Board of Trade, which may hear the case and give a decision or refer it to the Court to be tried. As the Comptroller is prohibited from registering as a trade mark any design that is not sufficiently distinct to prevent it being mistaken for any other already registered, it will be seen that unless care is taken to comply with this condition, refusal to register is likely to follow, and this preliminary stage may become both tedious and costly. Before exercising any discretionary power adversely to the applicant the Comptroller must, however, give him ten days' notice of a time when he may be heard personally or by his agent in support of his application. But if no objection be raised, the application is to be advertised, as soon as may be after its receipt, in the official journal, during such times and in such manner as the Comptroller may direct. The advertisement must contain either a representation of the mark desired to be registered or else a reference to a place where one may be seen, and for this purpose the applicant may be required to furnish one or more wood blocks or electrotypes, to the satisfaction of the Comptroller, an extra charge being made if the illustration occupies in the journal a depth of more than two inches. Any person wishing to oppose an application must within two months of the first advertisement give notice of opposition to the Comptroller, in duplicate, stating the grounds upon which it is based, the fee for entering such a notice being twenty shillings for each mark to which it applies. One of the copies is to be sent by the Comptroller to the applicant, who is allowed two months to prepare a counter claim. In the event of this being done the opposition cannot be carried further unless security is given by the person raising it for costs in the trial that would follow. In the event of no opposition being raised, as soon as may be after the expiration of the two months, and on the payment of a fee, which for one or more articles included in one class amounts to

twenty shillings, the Comptroller is to effect the registration in the Register of Trade Marks and notify the applicant that this has been done.

For the purposes of the Act a trade mark must consist of or contain at least one of the following essential particulars: (*a*) a name of an individual or firm printed, impressed, or woven in some particular and distinctive manner; or (*b*) a written signature or copy of a written signature of the individual or firm applying for registration thereof as a trade mark; or (*c*) a distinctive device, mark, brand, heading, label, ticket, or fancy word or words not in common use. The Comptroller is not, however, prohibited from entering in the Register, as an addition to the trade mark, any distinctive device, mark, brand, heading, label, ticket, letter, word or figure, or combination of letters, words or figures, though the same is common to the trade in the goods with respect to which the application is made, provided that the applicant disclaims in his application any right to the exclusive use of it. The number of classes into which goods are divided is fifty, of which those most likely to interest our readers are the following:—(1) Chemical substances used in manufactures, photography, or research, and anti-corrosives; (2) chemical substances used for agricultural, horticultural, veterinary and sanitary purposes; (3) chemical substances prepared for use in medicine and pharmacy; (4) raw or partly prepared vegetable, animal and mineral substances used in manufactures, not included in other classes; (8) philosophical and scientific instruments and apparatus; (11) instruments, apparatus and contrivances, not medicated, for surgical or curative purposes; (20) explosive substances; (42) substances used as food or as ingredients in food; (43) fermented liquors and spirits; (44) mineral and aerated waters; (47) candles, soap, detergents, illuminating, heating and lubricating oils, matches, and preparations for laundry purposes; and (48) perfumery. Although a trade mark must be registered for particular goods or classes of goods, several trade marks, resembling each other in the material particulars and differing only in details, may be registered as a series in one registration, each being deemed and treated as registered separately, except that the series can only be assigned as a whole. In this case the fee for registering is to be twenty shillings for the first representation in each class and five shillings for every additional one after the first in each class. A trade mark may be registered in any colour, and this (subject to the provisions of the Act) confers on the registered owner the exclusive right to use the same in that or any other colour.

The registration of a trade mark is to be deemed equivalent to the public use of the mark, whilst the registration of a person as a proprietor of a trade mark will be *primâ facie* evidence of his right to the exclusive use of it, and becomes conclusive evidence at the end of five years. Hereafter no person is to be entitled to institute proceedings in respect to infringement of any trade mark that is capable of registration, unless it has been registered or has been objected to by the Comptroller. A registered trade mark can be assigned and transferred only in connection with the goodwill of the business concerned in the particular goods or classes of goods for which it has been registered and it is determinable with that goodwill. Upon the passing of the right in a registered trade mark from one person to another the new proprietor may upon application to the Comptroller, and, in addition, making a statutory declaration, supplying any other evidence required, and paying a fee of twenty shillings, have his name entered in the Register as such, and the person entered as proprietor is to be deemed for the time being, unless otherwise shown, the person entitled to use and deal with the trade mark. The Register of Trade Marks is to be open to the inspection of the public daily, except on Sundays and holidays, the fee payable being one shilling for every quarter of an hour occupied in the inspection. At a time between two and three months before the expiration of each period of fourteen years from the date of the registration of a trade mark, the Comptroller is to send notice to the then registered proprietor that unless before the expiration of the fourteen years a fee of twenty shillings is paid the trade mark is liable to removal. If the fee be not paid at the expiration of a month a second notice is to be sent, and if the period of fourteen years run out whilst it is still unpaid the Comptroller is authorized to remove the mark from the Register after the lapse of another three months, unless meanwhile he receives the increased fee of thirty shillings. After erasing a trade mark from the Register for this cause the Comptroller is at liberty to restore it upon payment of a fee of forty shillings; but in any case the mark is to be deemed, in respect to any application for registration during the five years next after the date of its removal, a trade mark which is already registered. Besides the foregoing provisions there are others as to corrections and alterations, as well as the settlement of disputes, and the second schedule to the "Rules" contains a series of forms adapted for such emergencies as can at present be foreseen.

It is not surprising that the fatal case of poisoning by a proprietary preparation containing antimony, which was reported in the *Pharmaceutical Journal* last week, has provoked in the public press some outspoken condemnation of the present state of the law in respect to the unrestricted supply of poisons to the public under this and similar forms. It is to be regretted, however, that such condemnations are so spasmodic, and are, as a rule, only uttered under the stimulus of more than usual publicity being given to some particular case out of the many in which, no doubt, injurious results follow the indiscriminate aud unintelligent manner in which preparations containing powerful poisons are now scattered broadcast among the community under cover of the patent medicine stamp. One most disheartening feature is the marked absence, where it might fairly be expected, of the knowledge of existing facts, so essential to any useful discussion of

the subject, as, for instance, it is manifested by an important public officer when, whilst acting in a semi-judicial character, he talks about persons being able to "take out patents without being compelled to state the ingredients," or when the editor of a leading daily paper, under a similar misconception as to what constitutes a "patent medicine," expresses a "regret that the Patents Act, which has just come into operation, contains no provision dealing with this matter." In like manner, a medical gentleman, in a letter printed on another page, writes as if pharmacists had not yet given any consideration to the subject, and expresses astonishment at a fact in respect to the persons who carry on the patent medicine manufacture, with which everyone connected with medicine or pharmacy might be expected to be familiar.

* * *

An Evening Meeting of the North British Branch of the Pharmaceutical Society will be held on Wednesday next, in the Rooms, 119A, George Street, Edinburgh, when papers will be read on "Salts of Nicotine," by Mr. D. B. Dott; "Preparations of Galazyne, or Artificial Koumiss," by Mr. A. Gibson; and "Aqueous Mixtures containing Chlorate of Potash," by Mr. J. R. Hill.

* * *

Wednesday next is the date fixed for the Chemists' Eighteenth Annual Ball, and it would hardly be necessary to call attention here to the fact were it not that the reminder may save some of our readers disappointment through neglecting until too late to secure the tickets they require, as the number is to be strictly limited. Applications should be made at once to the Honorary Secretary, Mr. F. W. Warrick, Old Swan Lane, E.C., or to one of the other gentlemen whose names are mentioned in the advertisment.

* * *

Another social gathering of pharmacists and their friends that seems to increase in favour with every repetition is the Annual Soirée of the Midland Counties Chemists' Association, which is to be held this year as usual in the Town Hall, Birmingham, on Friday, the 25th inst. Tickets may be had from the Stewards or Mr. C. Thompson, Honorary Secretary, Stratford Road, Sparbrook.

* * *

We learn from an advertisement that the Madras Government has decided to adopt the advice given by Dr. Trimen and appoint a chemist as quinologist in connection with the Nilgiri Cinchona Plantations. The appointment is to be for five years, and the desiderata for it are a thorough qualification in the practice of organic analysis, and, if possible, experience in the analysis of cinchona bark, whilst the salary offered is 350 rupees per month, rising to 500 rupees, with a free passage to India and back. The estimate of the Government as to the value of the services that can be rendered by the new officer, so far as it is revealed by the remuneration, appears to be somewhat moderate, and considering the rarity of the most essential qualification, a practical experience in bark analysis, it is in our opinion considerably below the requirements of the case.

* * *

A report has just been issued dealing with the Oxford Local Examinations held at thirty-six centres in June last. From this it appears that the total number of candidates examined was 1845 (1192 juniors and 653 seniors), of whom 1055 (636 juniors and 419 seniors), or 57 per cent., passed; some of the 160 seniors were unsuccessful in more than one of the essential "preliminary" subjects, as there were 81 failures in grammar, etc., and 127 in arithmetic; but taking those who only failed in one "preliminary" subject, there were 34 unsuccessful in grammar, etc., and 79 in arithmetic. In like manner among the 277 unsuccessful junior candidates there were two failures in reading, three in writing, nine in spelling, 75 in dictation, 81 in grammar, and 174 in arithmetic; but of those who failed in one "preliminary" subject only 34 were incompetent in dictation, 34 in grammar, and 138 in arithmetic. The number of failures in arithmetic is very suggestive of imperfect teaching of this essential branch of education, but it is quite in accordance with the experience in connection with the Preliminary examination of the Pharmaceutical Society.

* * *

According to a statistical abstract of failures in the United Kingdom, published in *Kemp's Mercantile Gazette*, the total number of persons who failed in business in the course of the year 1883 was 11,465, of whom 93 were described as chemists and druggists, against 87 in the previous year. The bills of sale registered, however, during the same time, fell in the case of chemists and druggists from 223 to 79.

* * *

On Thursday evening, January 3, Dr. MacAlister delivered at the London Institution a lecture, the title of which was "How a Bone is Made." He commenced by showing the construction of the femur, and then opened an interesting discussion upon the advantage of the shape and hollowness of that bone. He spoke of the femur as consisting of a hollow tube, broadening out into lobes at either end, which were filled with a cancellated mass. In comparing the value of several materials as to their capabilities of sustaining tension or compression, the lecturer mentioned that in both steel and bone they were found to be nearly equal, whilst cast iron could withstand nearly six times as much power used in compression as that used in tension. In the use of cast iron, therefore, a great deal of material would be wasted in the making of the tension power up to the required capability, and this would necessitate bulkiness in comparison to bone and steel. With reference to the hollowness of the bone, Dr. MacAlister explained very clearly that the strength of the bone did not nearly decrease in the same ratio as the quantity of of material taken from the interior. As an example of this he showed that although a femur of a person of twenty-one years of age weighed nearly two and a half times as much as a femur of the same external appearance and size, which had belonged to a person of one hundred and three years of age, and had become more hollow with age, nevertheless the latter was very nearly as strong as the former.

* * *

At the next meeting of the Chemical Society, to be held on Thursday, January 17, papers will be read on "Camphoric Peroxide and Camphorate of Barium," by C. T. Kingzett; "On the Decomposition of Silver Fulminate by Hydrochloric Acid," and a "Supplementary Note on Liebig's Production of Fulminating Silver without the use of Nitric Acid," by Messrs. Divers and Kawakita, and "On Hyponitrites," by Messrs. Divers and Flaga.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, January 9, 1884.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Messrs. Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Symes, Williams, Woolley and Young.

The minutes of the previous meeting were read and confirmed.

The VICE-PRESIDENT said he had been glad to see published in some of the daily papers the list of the examiners. He should also like to see the result of the examinations published in the same way. He understood this was done in Scotland.

The PRESIDENT said there would be no objection to this if the names of unsuccessful candidates were not given. The information could be sent to the press, but of course its insertion could not be guaranteed.

THE LATE MR. J. E. HOWARD, F.R.S.

The PRESIDENT read a letter received from Mrs. Howard, in acknowledgment of the letter of condolence sent her, and also thanking those members of the Council and other officers of the Society who had attended the funeral.

THE BOARD OF EXAMINERS.

The Secretary read a letter, which had been received from the Privy Council, approving the appointment of the Examiners appointed last month.

DIPLOMAS.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Bing, Charles.
Burford, Samuel Francis.
Collins, Herbert Sleight.
Cornwell, Thomas Chinsura.
Dolbear, John.
Dymond, Thomas Southall.
Jones, Charles.
Low, David.
Mitten, Flora.
Mowatt, John Rodman.
Sergent, William Thomas.
Taylor, Ernest Sanderson.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

The following pharmaceutical chemists, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Bing, Charles .....Canterbury.
Burford, Samuel Francis.....Leicester.
Collins, Herbert Sleight .....Bradford.
Cornwell, Thomas Chinsura ...Penzance.
Loumeau, Edmond .....Mauritius.
Low, David .....Hexham.
Mitten, Flora .....Hurstpierpoint.
Mowatt, John Rodman .....London.
Phillips, John Edwards .. ..Ealing.
Pirie, William ....Edinburgh.
Sergent, William Thomas .....North Shields.
Taylor, Ernest Sanderson .....Grantham.

Chemists and Druggists.

The following chemists and druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Coley, James..... ....Bootle.
Evans, William .....Mold.
McMurray, James .....Helensburgh.
Nicholson, William Ostler .....London.
Shepherd, Charles William.....Ilkley.
Sleight, William Wilson..... ...New Wortley.
Trundle, William E. Rust .....Plaistow.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society.

Brook, Samuel Verlander .....Cradley.
Grove, Harry Nicholas .....Walsall.
Jones, John Wesley .....Llanelly.
Laing, Arthur Laurenson .....Lauder.
Law, Thomas Wm. Thorburn...Partick.
Robertson, Alexander..... .....Oban.

ASSOCIATES.

The following, having passed their respective examinations and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Ashton, Charles Sampson .....Yeovil.
Barnes, William Robert .....Plaistow.
Bell, Charles Russel ....London.
Brampton, Wm. Saml. Howes...Stanion.
Brown, Edgar Marshall .....Derby.
Brown, Horace..... .....Thrapston.
Daniel, George.....Holsworthy.
Farrer, Edward ....Kendal.
Gibson, John .....Barnard Castle.
Jackson, Walter .....Catterick.
Jackson, William John T. .....Lytham.
Lipp, George ....Elgin.
Morris, Henry Ridley.....Ipswich.
Owen, Henry .....Gravesend.
Rees, David .....Haverfordwest.
Richardson, John.....Mansfield.
Riley, John Cowgill .....York.
Roberts, Rowland ....Holyhead.
Robertson, Charles .....Edinburgh.
Shacklock, James Harvey .....South Cave.
Smith, Albert Edward .....Sudbury.
Stocker, George .....Exeter.
Sutherland, Adam Gordon... ..Edinburgh.
Tallantyre, John Mortimer ...Manchester.
Wride, Francis Blake .....Shirley.

Modified.

Price, Benjamin William .....Farnham.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Allen, Richard.....Ramsey.
Anthony, Thomas .....St. Austell.
Aston, Alfred Valentine.....Tarporley.
Balmford, John Archibald .....Huddersfield.
Bard, Cecil Harry .....Exeter.
Barritt, Ernest Henry.....Colchester.
Barton, John.....Warwick.
Bates, John .....Bicester.
Bates, John .....Manchester.
Baxter, George Munnerley.....Chester.
Black, James Watson ....Aberdeen.

Bonnett, Frederick .....Doncaster.
Boole, Lucy Everst .....London.
Bostock, John William .....Ashton-under-Lyne.
Brown, Henry Armstrong .....Sunderland.
Browne, John .....Lowestoft.
Casewell, Job Parry.....Market Drayton.
Chamberlain, Charles John ...Portsea.
Courtis, Terrell .....London.
Cullinan, Edward, jun. .....London.
Dancy, Ralph ....Turner's Hill.
Dell, Frederic Barton .....Llanelly.
Donack, James.....Moffat.
Dunn, Isaac George.....Chard.
Earle, Ernest Haworth .....Hull.
Egg, George Frederick .....Highbury.
Evans, Daniel Thomas .....Llandyssul.
Farlow, James Southward .....London.
Featherstone, Robert Horne .. Derby.
Fellows, Vincent Litchfield ...Hampstead.
Fifield, Tom Hadley .....Birmingham.
Fletcher, Harold Goodwin.....Ripley.
Fothergill, Alfred .....Newport (Mon.)
Fuller, George Sydney ... .Thornton Heath.
Golds, Lewis George .....Steyning.
Golightly, John William.....Durham.
Griffiths, Cornelius Albert .....Cinderford.
Hampson, Herbert Edwin .....York.
Harrison, Thomas .....Birmingham.
Hearnden, Frederick .....London.
Henderson, Thomas Cuthbert...Lochee.
Hepworth, John Stafford .....Hyde.
Herbert, Henry William .....Barton-on-Humber.
Hider, Francis .....London.
Hind, William Tom .....Leicester.
Hobbs, Alfred Ernest .....Tunbridge Wells.
Horne, Joseph .....Aberdeen.
Hughes, Philip Henry A. .....Liverpool.
Johnston, William .....Montrose.
Johnstone, John ..... Selkirk.
Jones, Edwin Pryce.....Aberdare.
Kent, Charles Edwin .....Hertford.
King, James, jun. .....Kilmalcolm.
Lewis, John Lloyd .....Llandyssul.
Lockyer, Cuthbert Henry Jones. Bruton.
Manfield, Robert Hall.....Pontefract.
Matthews, Edwin James .....Cowbridge.
Maudson, Charles Fredk. .....Leeds.
Meacham, Vincent Whittenbury. Ledbury.
Mitchell, John .....Inverness.
Munro, James Innes .....Perth.
Padley, Frank Robert.....Birmingham.
Paine, William.....Ashton-under-Lyne.
Parry, John .....London.
Paternoster, George Sidney ...Cirencester.
Patterson, David .....Bolton.
Potts, Robert ... .Newcastle-on-Tyne.
Price, Peter .....Bromsgrove.
Purchase, Francis William .....Bideford.
Rees, John .....Aberystwith.
Roberts, Willam Arthur.....Bangor.
Sales, John William.....Doncaster.
Salter, Albert Joseph .....Uckfield.
Scott, Walter H. .....Beverley.
Selby, Henry Collingwood .....London.
Smith, Edward Gibbs .....Walton-on-the-Naze.
Smith, Samuel Henry .....Leamington.
Stuart, Findlay.....Dumbarton.
Sursham, Frederick Thomas ...London.
Townsend, William Thomas ...Bradford.
Tugwell, Ernest Harry .....Greenwich.
Turner, Ebenezer .....Whifflet.
Twivey, Arthur .....Tadcaster.
Webster, John, jun.....Buckie.
Whitehead, John Henry .....Leeds.
Williams, Alfred .....London.
Williams, Joshua Edward .....Bryn Glas.

Restoration to the Register.

The name of the following person, who had made the required declarations and paid a fine of one guinea, was restored to the Register of Chemists and Druggists:—

Sutton Dudley Gill, 221, Spon Lane, West Bromwich.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Additions to the Register.

The Registrar reported that—

William Botterill Parker, 5, West Street, Leeds, and Henry Barker Travis, 528, Brightside Lane, Sheffield,

having respectively made statutory declarations that they were in business before the passing of the Pharmacy Act, 1868, and these declarations having been supported by duly qualified medical practitioners, their names had been placed on the Register.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

Mr. Greenish suggested that it would be well if in each case the resolution approving the reports of committees should be moved by the member who had acted as chairman of the committee. He could then draw the attention of the Council to any subject which seemed to require notice.

Mr. Richardson supported the suggestion. He said it was very important that the attention of the Council should be called to anything in connection with these reports which was of general interest.

Mr. Schacht suggested that it would be a great convenience in the conduct of business if a permanent chairman were appointed to the Finance Committee each year. The business of this Committee differed from most others in being of a character not so readily mastered, and he had often noticed that information had to be obtained from the Secretary or the office on the bearing of certain matters which came before the Committee.

Mr. Williams said the bye-laws provided that the President or Vice-President should preside at the meeting of any Committee at which they were present.

Mr. Schacht said it would be very easy for the President or Vice-President to be appointed chairman of the Finance Committee for the year.

Mr. Gostling said it had been the practice for the Vice-President to act as chairman of the Committee, and if he was not present there was generally a former President or Vice-President who could fill the post.

The Vice-President thought it would be very well to have a permanent chairman for the Finance Committee.

Mr. Richardson said it was impossible for the President or Vice-President to take the chair at every meeting of a committee, but it would be very useful to have a permanent chairman of the Finance Committee.

Mr. Young thought it was a pity to disturb the existing arrangements which had worked so well, and it seemed very proper that the President or Vice-President should preside at the Committee meetings. The point raised by Mr. Greenish was simply that whoever had officiated as chairman of the Committee should bring forward the report and mention any point which required notice.

Mr. Greenish remarked that he was quite satisfied, after what had been said, to leave the matter in the hands of the President.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£20 to a former member, aged 62, who had a similar

grant in 1880. Suffering from a paralytic seizure. Surrey.

£10 to the widow of a registered chemist and druggist, aged 49; has six children. Applicant has had two previous grants. Middlesex.

£10 to the widow of registered chemist and druggist, aged 42. In ill health; has three children. Has had three grants previously. Lancashire.

£10 to a registered chemist and druggist, aged 40. Formerly in business, but now out of employment. Middlesex.

£20 to a former member and subscriber to the Benevolent Fund, aged 62. Applicant has had three previous grants and was an unsuccessful candidate at the last election. Middlesex.

£10 to the widow of a registered chemist and druggist, aged 63. Has had three previous grants and was an unsuccessful candidate at the last election. Surrey.

£21 to be placed in the Secretary's hands and used at his discretion in securing the election of the youngest of Ord's orphans to the London Orphan Asylum.

The Committee recommended the addition of certain names and amounts to the Benevolent Fund Donation Board and the alteration of the amounts in other cases where the donations had been increased.

The Committee had considered the regulations for the distribution of the Fund and recommended the following alterations* :—

Rule 8. "In all petitions for assistance from the Fund the truth of the statements shall be certified by at least two Members or Associates in Business of the Society, or two donors or subscribers to the Fund, who are personally acquainted with the facts of the case."

Rule 9 to be concelled.

The VICE-PRESIDENT, in moving the adoption of the report, said he was glad to see that the attention called to the Benevolent Fund was finding a response outside. The question raised by Mr. Hampson's letter, calling attention to the difficulty which might arise in initiating applications for relief, had been reconsidered and after full and careful consideration, the decision arrived at was that two signatures only should be required, either of members, associates or subscribers, but that no limit of amount should be placed on the subscription qualifying the signature to be appended. If there had been any difficulty in getting recommendations, that would now be obviated, and he trusted this conclusion would be accepted.

The PRESIDENT said the change practically consisted in reducing the number of signatories from four to two, and abolishing the restriction as to the length of time during which the subscription had been current and the amount.

Mr. SCHACHT seconded the motion.

Mr. BOTTLE moved as an amendment—

"That the recommendation of the Benevolent Fund Committee to reduce the number of signatures from four to two on the application paper for relief be not entertained, but that the number of signatures be four as heretofore."

* The following are the clauses in the Regulations proposed to be amended:—

"8. In all petitions for assistance from the Fund the truth of the statements therein contained shall be certified by at least four members of the Society, or donors to the Fund of five guineas, or persons who have subscribed not less than half-a-guinea per year for the three preceding years, and who are personally acquainted with the facts of the case.

"9. In the case of a widow or orphan applying for relief and unable to obtain the required evidence under Rule 8, the Council will receive and consider in lieu of such evidence the testimony of four respectable householders, to whom the circumstances of the applicant are known, provided that the persons so certifying are respectively subscribers or donors to the Fund of not less than half-a-guinea for the current year."

He thought there had been no necessity shown for the alteration, and he was conservative enough to believe in keeping things where they were when no cause was shown for change. The Council was told that difficulties might arise, but he thought the regulations might remain *in statu quo* until difficulties did arise. He also spoke in the interests of the applicants, because the Committee scrutinized every recommendation which came before it, and if one came signed by two names only and another signed by four, he thought the applicant recommended by four, would have a considerable advantage over the other. The decision was only come to in committee by a narrow majority, and therefore he thought it might be reviewed. It might be said there was a difficulty in a deserving candidate getting signatures, but he did not think that there was, and inasmuch as it necessitated the petition being handed about before it was presented to the Council, it was an advantage to the Fund. He was quite willing to allow a subscriber of any amount the privilege of nominating, but did not like to see the number of signatories reduced.

Mr. ROBBINS seconded the amendment, as he thought the proposed alteration would prove pernicious. He had had some experience of the Benevolent Fund and had never found this difficulty arise. The Committee was generally guided by the fact that the application was supported by persons of whom something was known, and although four names were necessary in the majority of cases one good name was sufficient to act upon. Now the Committee might not be able to pick one good name out of two so well as one out of four, and considering the other alterations, the names would not be so good. A paper might be signed by two apprentices, and if made too easy some might be tempted to apply to the Fund who otherwise would not have done so. When it required the names of influential members of the Society there was some difficulty, no doubt, and there was an advantage in there being some little difficulty in obtaining relief, but these difficulties had not been sufficient to prevent applicants coming forward, seeing that in the last year nearly £2000 had been expended. If it were necessary to make any change at all, let the Council insist on the signature of the Local Secretary, or someone it knew something about.

Mr. HAMPSON was sorry that this question did not seem likely to be settled without another discussion. When the report of the Committee was read he felt grateful to the Committee for arriving at a conclusion which, if carried out, he felt sure would not only promote the interests of the Fund, but make the investigations as to the character and position of the applicants more easy, and probably the information when obtained would be of a better quality. He could not understand the objection of the last speaker, that if only two persons signed the paper their names would be of little use. He also said that one signature generally guided the Committee, and surely out of two there might be one in whom the Committee would have confidence. He maintained that it was a hardship that a person who signed these papers should have either to be a donor of five guineas or a subscriber of half-a-guinea for three years, and in many cases applicants had to undergo great trouble and inconvenience in getting signatures.

The PRESIDENT reminded Mr. Hampson that the only point in question was whether the number of names should be two or four.

Mr. HAMPSON thought the proposal of the Committee would in no way damage the Fund. He could not agree that there had been no inconvenience in the past; there had been great inconvenience in getting the right signatures, and almost invariably the names attached to the papers had not the quality mentioned by the Treasurer, that is to say persons signed the paper not of their own personal knowledge.

Mr. ROBBINS explained that his meaning was, if there

were four signatures there was a greater probability of finding one amongst them whom the Committee knew than if there were only two. As to the quality of the signatures he thought there was a better quality now than there would be under the proposed alteration, which might mean only the signatures of two apprentices.

Mr. BORLAND said the members of the Council seemed to be all agreed as to the abolition of the restriction on the amount, and the only difficulty was as to the number. Now on looking over the Calendar he found that out of about six hundred and eighty places or towns in which there were chemists subscribing to the Fund there were only one hundred and thirty-seven in which there were four subscribing chemists, the remaining five hundred and forty not having the necessary number. If then the number were maintained at the four the applicants at those places must go outside their own district to find two additional subscribers. In Kilmarnock any person requiring four signatures would have to go at least twenty miles, and then would only get individuals who in all probability knew nothing whatever of the character of the applicant. On that ground he supported the report of the Committee.

Mr. SAVAGE thought the suggestion of the Committee a very wise one, and scarcely thought the mover of the amendment was right in stating that hitherto the regulations had worked well. The Council was really not in a position to know what difficulties had arisen in obtaining signatures, and no doubt there had been considerable difficulty here and there which the Committee knew nothing about. If the minimum number was reduced to two, it did not prevent the Committee obtaining further information if necessary.

Mr. WOOLLEY supported the amendment. He had been for some years on the Benevolent Fund Committee, and no difficulties had come under his notice, and it was not usual to legislate for difficulties of which one had no knowledge. He thought the Council should be content with a reduction of the amount, which would increase the number of subscribers; and to meet the point suggested by Mr. Borland he thought there would not be much difficulty in getting two persons in a place to subscribe a small amount, and thus become eligible to sign the paper.

Mr. HILLS suggested that the decision on this point should be deferred; it was rather difficult for those not members of the Committee to vote suddenly on a question of this kind, altering the regulations which had been in force for many years. He had not yet heard of any case of difficulty which had arisen, and should be inclined to leave things as they were, but perhaps if he had further time to consider the alterations he should be better able to form a judgment. He asked if he correctly understood the proposition, that two apprentices by each giving a donation of half-a-crown for a specific object should be able to sign an application paper.

The PRESIDENT said, Certainly.

Mr. HILLS said he objected to that altogether.

Mr. HAMPSON said the Council did not contemplate such a case arising. If thought desirable it might be limited to householders or persons over twenty-one years of age.

Mr. RICHARDSON said some gentlemen seemed to lose sight of the fact that the object of the Benevolent Fund Committee was to get in all possible applications with the least possible difficulty to the applicant. It did not at all follow that all applications would be acceded to. The Committee sat every month to sift these applications, and even if two apprentices signed an application for relief, it did not follow that the Committee would act on the suggestion. Each case was first sifted by the office, and then submitted to the Committee, so that there was every possible safeguard. He hoped this discussion would have the effect of increasing the number of chemists and druggists who subscribed to the Fund. No doubt the previous arrangements were somewhat restrictive, and in small towns it must be difficult for persons to get their applications signed. At the present time it was often found that the signatories were members of wholesale houses in some other town. Only on the previous evening there had been a case in which the application was signed by three or four wholesale druggists, who could not possibly have that knowledge which even an apprentice might have in the town from which it emanated.

Mr. SYMES said although difficulties had not been numerous no doubt some had arisen which had not come under notice, and as the matter had been under consideration for a month it would be as well to come to a decision. The members of Council seemed all agreed that the existing rule was a hardship, but he should support Mr. Bottle's amendment if he meant to limit the number to two subscribers; in fact, that there should be four names, including two subscribers, whose names should appear on the Register of Chemists and Druggists, and two respectable householders. He could not conceive any place where a difficulty may arise in a person getting such signatures. There was a little danger in making it too easy to obtain relief; it had a prejudicial influence on the candidates themselves, for it was a remarkable fact that when a person found out the means of getting a grant he generally came again. Under the new regulation the paper might be signed by persons not subscribers.

Mr. WILLIAMS said he strongly supported in committee the view taken by Mr. Bottle that the number of signatories should be four. He did not consider that number at all too many, and even if it were increased it might be a safeguard to the Committee. It was very important that the Committee should not be misled in any way by misstatements or informal applications; there was a greater safety in four signatories than in two, but he did not at all agree with Mr. Symes that those who did not subscribe at all should have the privilege of signing the paper. He was quite willing and anxious that the alteration should be made so far as taking away the restriction that persons must have subscribed half-a-guinea a year for three years previously, which, no doubt, was a hardship; but he thought the amount of half-a-guinea ought still to be retained, as the lowest amount to be subscribed by those who signed the paper, though he was willing to waive that, and accept the half-a-crown, which was the smallest amount taken, if the Council thought fit. He had hoped, however, that the Council would reverse the decision carried by a very small majority in the Committee, and insist on four names being appended.

Mr. YOUNG said it seemed to be generally accepted that the present arrangements were not satisfactory, owing to the difficulties which applicants might have in finding four individuals in a small place who were subscribers of half-a-guinea to the Fund. The question seemed to be whether the subscribers to the document should be two or four, but since he had been a member of the Committee he had often noticed that, while there were four subscribers' names attached, when these persons were written to they often replied that they knew very little about the applicant. That arose from the circumstance mentioned by Mr. Richardson that in many cases they were members of wholesale houses with whom the applicant had done business. The Committee would not be tied to two, but might still require four; in addition to that the Council knew the careful investigation which was made in every case by the Secretary; he, therefore, thought it would be a great improvement if the number was limited. He certainly was not prepared for the statement that two apprentices might sign the document, and he should certainly prefer two householders; two good names would be better than a long list of persons who did not know the applicant personally.

Mr. GREENISH said he should support the amendment. Two questions were considered in the Committee, one

whether this clause, with regard to the subscribers of half-a-guinea for three years, should be retained, and the other, whether four names were necessary, or whether the number should be reduced to two. He was quite agreed with the first alteration, that any subscriber to the Fund should be eligible to sign; but, having made that concession, it was more than ever important that there should be four names, because they were now likely to include a different class of subscribers. A person might get two apprentices to sign their names, but it was not likely he would get four.

Mr. RADLEY supported the proposition of the Committee, and he was influenced in this course, to a certain extent, by the difficulty that had been experienced with regard to widows. There was frequently great difficulty in widows getting their papers properly signed, they not, as a rule, being known to members of the trade. He certainly felt a little objection to the idea of the paper being signed only by two apprentices, and should prefer the word "householders;" but the process was only the initiatory one.

The PRESIDENT said the lines on which some members of the Council seemed to regard the application paper were, in his opinion, quite erroneous. They seemed to look upon this paper as a passport to the money; but it was nothing of the sort. It was intended so to be when first instituted, but it had proved utterly untrustworthy. He asserted that as the result of his experience during the last two and a half years and from former experiences on the Benevolent Fund Committee. When there were four signatures, it might be of large subscribers or respectable members of the Pharmaceutical Society, the chances were that the case was not known to more than one out of the four persons signing, and the intention that the application paper should be a passport to a grant was a failure. That being so he preferred to regard the paper as a simple recommendation that the case should be considered. If that were so, was it necessary to ask for four signatures? The question had been discussed in committee whether householders alone should be eligible; but the Secretary, who had more to do with the Benevolent Fund than all the Council put together, had during the recess actually proposed that the alteration should be—and he agreed with him—that any householder should sign. The Secretary said the limiting of the signatories in the case of non-members and non-associates to subscribers did not produce money to the Fund, and he (the President) did not think it did. The real information on which a committee made a grant was that obtained on an application for further information to either one or all of the individuals signing, and the Committee often referred to other persons, or applied direct to the Local Secretary. The paper ought to be regarded as no more than it was worth, the preliminary or initial stage. It would have been impossible to give the relief that had been given if each of the four persons who had hitherto signed these papers had been obliged to swear that he was personally acquainted with the cases for the number of years stated, and could confirm all the particulars to the best of his belief. What was really wanted was to get at one or two persons who knew the case, not a number of respectable people who would support, but who did not know it thoroughly. He believed that by reducing the numbers from four to two the chance of getting the right information would be increased, and the temptation to sign the paper formally out of kindness decreased. With regard to apprentices, why should not they sign if they were subscribers and knew the case. Members and associates of the Society were practically subscribers by virtue of the large sums tranferred from the General Fund to the Benevolent Fund in days gone by, and to that extent, therefore, it was considered that every member and associate in business was a subscriber. If the signatories were limited to members, associates or subscribers, why should not apprentices, if subscribers, be eligible? It was not at all likely that many would be unable to get signatures except from two apprentices, but if any person could not it was no reason his case should not be investigated. The Committee did not make a grant on the application, but on the investigation. On these grounds he hoped the Council would take a broad view, and adopt the report.

Mr. CHURCHILL said he was glad this discussion had taken place in order that subscribers might see how carefully the Fund was administered. He quite agreed with the President in believing that the main thing which influenced the Committee was the application of the Secretary to the signatories for an exact account of what their real knowledge of the person was, and further than that he had the opportunity of asking the Local Secretary or a member of the Council to look into the case. In that way the Committee had often been able to get at facts which did not appear on the application paper.

Mr. WILLIAMS said it seemed a most extraordinary line of argument that two names should be better than four.

The VICE-PRESIDENT said the amendment would permit four apprentices to sign, but he did not think many apprentices would do so. He wished to emphasize one point, viz., that this was nothing but the initiatory stage; it was the collateral evidence by which the Committee was guided.

The amendment was then put with the following result:—

For—Messrs. Bottle, Butt, Churchill, Greenish, Hills, Robbins, Symes, Williams and Woolley.

Against—Messrs. Atkins, Borland, Carteighe, Gostling, Hampson, Radley, Richardson, Savage, Schacht and Young.

The amendment was, therefore, lost.

Mr. WILLIAMS then moved as an amendment to the original motion—

"That after the word 'subscribers' the words 'being householders' be inserted."

He thought it would be very dangerous if papers were to be signed by apprentices or anybody else who might choose to put down half-a-crown for the privilege of signing.

Mr. HILLS seconded the amendment.

Mr. HAMPSON hoped that Mr. Williams would withdraw this amendment as it would exclude all assistants who might be interested in the Fund.

Mr. WILLIAMS said if there were a paper signed by two apprentices and the Secretary wrote to them for further information, what guarantee was there that he would get anything like a proper and reasonable statement of the case. When the Council was administering a fund collected all over the country it ought to take the greatest care that the money was distributed properly. If any person wanted a grant he could not have much difficulty in finding two subscribers who were householders.

Mr. SAVAGE said the great point to be remembered was that this was merely the initiative. The Committee was not limited to those two individuals; the Secretary had the opportunity of writing to the Local Secretary, or anyone he knew.

The PRESIDENT hoped the Council would vote upon this amendment without entering into another long discussion. It appeared to him that the testimony of two educated apprentices was quite worthy of attention.

Mr. WOOLLEY said it was not at all a question of the respectability or education of the apprentices, but it was a question of whether a man was of full age or not. There were apprentices perfectly competent to initiate an application of this kind, but there were others who would not be. It seemed to him the Council was making a sudden departure without any reason, and opening the door far too wide for those applications.

Mr. RICHARDSON considered that every person who

subscribed to the Benevolent Fund was entitled to sign an application for relief.

Mr. GREENISH thought now the subscription was lowered to half-a-crown some method of hedging the Fund round should be adopted.

Mr. GOSTLING suggested that the word "householders" might lead to difficulties. He should prefer a limit of age.

The amendment was then put with the following result:—

For—Messrs. Bottle, Butt, Churchill, Hills, Radley, Williams and Woolley.

Against—Messrs. Atkins, Carteighe, Gostling, Hampson, Richardson, Savage and Schacht.

Messrs. Borland, Greenish, Robbins, Symes and Young were present at the division, but did not vote.

The numbers being equal the President gave his casting vote against the amendment.

Mr. BOTTLE then proposed another amendment.

"That the proposed alterations be printed and referred back to the Benevolent Fund Committee to report upon."

Seeing the division was so very close it appeared to him to be the wisest course to adopt.

Mr. HILLS seconded the amendment.

Mr. HAMPSON said he had confidence in the Committee's report. This was the second time it had considered the question, and surely its decision ought to be treated with some respect.

Mr. GOSTLING supported Mr. Bottle's suggestion. He thought there was nothing to be gained by precipitancy, and as there was such an even balance of opinion on each side, he thought it would be much better to wait until the members of the Council were more at one as to the desirability of the alteration.

Mr. SCHACHT said he should regret if this question were again deferred. Last month he gave his reasons for the opinion he then expressed in favour of making the thing as open as possible, providing the recommendation was limited to those who in some form or another supported the Fund. He deprecated any further postponement of the question, because at the February meeting there would be a great deal of other business to do.

The VICE-PRESIDENT also hoped that it would not be deferred, as it would lead to a great waste of time in going over the whole question again.

Mr. ROBBINS said the new Calendar was issued at the beginning of the year; the regulations there given would therefore be wrong for the next twelve months if the proposed alterations were now made.

Mr. SYMES said the error would be in the right direction. He did not think anything would be gained by reconsidering the subject.

The PRESIDENT said the Committee was very equally divided before, and would be equally divided again. It would be much better to settle the matter one way or the other.

Mr. GREENISH said he was surprised to hear any member of the Council say it was a waste of time to discuss a question of this importance.

Mr. BOTTLE said he would withdraw the amendment, but in doing so he wished to protest against the assertions made over and over again that the recommendatory paper was only the initiative. It was so in the sense of bringing the matter before the Council, but it was the line upon which the Secretary at once acted in getting the information upon which the Council made the grants. He for one personally knew nothing of any individual who came forward on the previous evening as recommended for relief; he accepted what was placed before him as evidence to judge of their merits, but in each case the Secretary had travelled on the lines of the application paper.

The original motion for the adoption of the report was then put and agreed to.

Robbins' Fund.

Mr. ROBBINS said he had been requested by the Benevolent Fund Committee to transfer the South Metropolitan Gas Shares to 4 per cent. Debentures of the Gas Light and Coke Company, which he had done. The shares realized £129 12*s.*, and the Debentures were £134 16*s.*, so that there was a difference of £5 4*s.*, which he had made up. He moved that the seal of the Society be affixed to the transfers.

The motion was seconded by the PRESIDENT, and carried.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
November	Day	478	28	9	18
	Evening	243	19	5	11

Circulation of books.	No. of Entries. Town.	Country.	Total.
November	191	138	329

Carriage paid, £1 17*s.* 11*d.*

The following donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Allgemeiner österreichischer Apotheker-Verein, Zeitschrift, 1883. From the VEREIN.

Alumni Association of the Philadelphia College of Pharmacy, Nineteenth annual report, 1883. From the ASSOCIATION.

American Journal of Pharmacy, 1883. From the PHILADELPHIA COLLEGE OF PHARMACY.

American Pharmaceutical Association, Proceedings, vol. 30. From the ASSOCIATION.

Analyst, 1883. From the EDITORS.

Annuaire des Spécialités médicales et pharmaceutiques, 1883. From the PUBLISHERS.

Archiv for Pharmaci og technisk Chemi, 1883. From the PUBLISHERS.

Botanical Society [of Edinburgh], Transactions, vol. 14, part 3. From the SOCIETY.

British Pharmaceutical Conference, Year-Book of Pharmacy, and Transactions, 1882. 2 *copies.* From the CONFERENCE.

Canadian Pharmaceutical Journal, 1883. From the ONTARIO COLLEGE OF PHARMACY.

Chemical News, 1883. From the EDITOR.

Chemical Society of London, Journal, 1883.

— List, 1883. From the SOCIETY.

Chemist and Druggist, 1883.

Chemists' and Druggists' Diary, 1884. From the PROPRIETORS.

Chemists and Druggists' Trade Association, Seventh annual report, 1883. From the ASSOCIATION.

Ephemeris of Materia Medica, Pharmacy, Therapeutics, etc., 1883. From Dr. SQUIBB.

General Medical Council, Medical register, 1883.

— Medical Students Register, 1883.

— Dentists Register, 1883.

— Minutes, vol. 19–20. From the COUNCIL.

Guy's Hospital Reports, vol. 26, 1883. From the HOSPITAL.

Imperatorskie S.-Peterburgskie Botanetsheskie Sad, Acta horti petropolitani, tom. 8, fasc. 1-2. From the SAD.

Institute of Actuaries, Journal, and Assurance Magazine, 1883.

— List of Members, etc., 1882. From the INSTITUTE.

Institute of Chemistry, Register of Fellows and Associates, 1883. From the INSTITUTE.

Kaiserliche Akademie der Wissenschaften in Wien, Anzeiger, mathematisch-naturwissenschaftliche Classe, 1883. From the AKADEMIE.

Linnean Society of London, Journal, 1883.

— List, 1883.

— Proceedings, 1875–83. From the SOCIETY.

Mason Science College, Calendar, 1883. From the COLLEGE.

Massachusetts College of Pharmacy, Catalogue, 1883. From the COLLEGE.
Massachusetts State Pharmaceutical Association, Proceedings, 1883. From the ASSOCIATION.
New Jersey Pharmaceutical Association, Proceedings, 1883. From the ASSOCIATION.
New Remedies, 1883. From the EDITORS.
New York State Pharmaceutical Association, Proceedings, 1883. From the ASSOCIATION.
New Zealand, Pharmaceutical Register for 1883. From the PHARMACY BOARD OF NEW ZEALAND.
Newcastle-upon-Tyne Chemical Society, Transactions, vol. 5, No. 12. From the SOCIETY.
Ny pharmaceutisk Tidende, 1883. From the PUBLISHERS.
Owens College, Manchester, Calendar, 1883. From the COLLEGE.
Pharmaceutical Society of Ireland, Calendar, 1883. From the SOCIETY.
Pharmaceutical Society of Victoria, Australasian supplement to the Chemist and Druggist, 1883.
— Twenty sixth Annual Report, 1883. From the SOCIETY.
Pharmacie Centrale de France, L'Union Pharmaceutique, 1883.
— Bulletin Commercial, 1883. From the PHARMACIE CENTRALE.
Photographic Society of Great Britain, Journal and transactions, 1883. From the SOCIETY.
Radcliffe Library, Catalogue of books added during 1882. From the LIBRARY.
Royal College of Physicians of London, List of Fellows, etc., 1883. From the COLLEGE.
Royal College of Surgeons of England, Calendar, 1883. From the COLLEGE.
Royal College of Veterinary Surgeons, Register, 1883. From the COLLEGE.
Royal Dublin Society, Scientific Proceedings, vol. 3, part 5.
— Scientific Transactions, vol. 1, parts 15–19; vol. 2, part 2. From the SOCIETY.
Royal Institution of Great Britain, Notices of the Proceedings, no. 75. From the INSTITUTION.
Royal Medical and Chirurgical Society of London, Medico-chirurgical Transactions, vol. 66.
— Proceedings, new ser., nos. 1–3.
— Additions to the Library, 1881–82. From the SOCIETY.
Royal Society of London, Proceedings, nos. 89–92, 222–26. From the SOCIETY.
St. Bartholomew's Hospital, Reports, vol. 18.
— Statistical Tables for 1882. From the HOSPITAL.
Smithsonian Institution, Annual reports for 1863 and 1881. From the INSTITUTION.
United States Army, Index-Catalogue of the Library of the Surgeon-General's office, vol. 4, 1883. From the SURGEON-GENERAL.
Université de Bruxelles, Annales, Faculté de Médecine, tome 3, 1882. From the UNIVERSITÉ.
University College, London, Calendar, 1883. From the COLLEGE.
University of Durham, Calendar, 1883. From the UNIVERSITY.
University of Glasgow, Calendar, 1883. From the UNIVERSITY.
University of London, Calendar, 1883. From H. M. GOVERNMENT.
Victoria, Pharmaceutical Register for 1882. From the PHARMACY BOARD OF VICTORIA.
Wisconsin Pharmaceutical Association, Proceedings, 1883. From the ASSOCIATION.
Yorkshire College, Ninth Annual report, 1883. From the COLLEGE.
Dragendorff (G.), Plant Analysis, translated by H. G. Greenish, 1883. From the TRANSLATOR.
Jones (H. M.), Treatise on aural surgery, 2nd ed., 1881.
— Atlas of Diseases of the Membrana Tympani, 1878. From the AUTHOR.
Plugge (P. C.), Natriumhypobromit als Reagens zur qualitativen und quantitativen Bestimmung des Ammoniakharzes, 1883. From the AUTHOR.

The Committee recommended the purchase of the undermentioned books:—

Blyth (A. W.), Poisons, 1883.
De Candolle, Monographiæ Phanerogamarum, vol. 5, pars 1.

The Librarian reported that the cabinet of slips forming a bibliography of pharmacy, which had been purchased by the Council, had been received, and was available for reference.

The Committee recommended that sundry volumes and parts of the Pharmaceutical Journal be presented to the Smithsonian Institution to complete a set for reference in the United States National Museum, Materia Medica Department.

The Committee recommended that the Journal of the Chemical Society, for March, 1881, February to December, 1882, and the indexes for the same years, be purchased for the Society's Library in Edinburgh.

Curator's Report.

The Curator had reported the attendance in the Museum to have been:—

	Total.	Highest.	Lowest.	Average.
Morning .	497	31	9	19
Evening .	136	12	1	5

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimen of Turtle Oil from the Seychelles.
Presented by Messrs. WRIGHT, LAYMAN and UMNEY.
Specimen of Oil of Petit Grain distilled in Paraguay.
Presented by Messrs. W. B. CRANWELL and Co.
Thirteen specimens of native remedies used by the Cree Indians of Hudson's Bay Territory.
Presented by Mr. W. HAYDON.
Specimen of Tupelo tree wood with bark attached.
Presented by Messrs. PARKE, DAVIS and Co.
Very fine specimen of Zanzibar Anime.
Presented by Mr. E. FIELDING.
Specimen of the root of Piptostegia Pisonis.
Presented by Messrs. SYMES and HALLAWELL.
Specimen of Cinchona succirubra cultivated in St. Thome, W. Africa.
Presented by Messrs. T. CHRISTY and Co.
Specimen of the bark of Strychnos Gautheriana.
Presented by Mr. JOHN SELLERS.

The Professors had attended and reported satisfactorily of their respective classes.

The report and recommendations of the Committee were adopted.

Mr. GREENISH said he should like a Committee, with the sanction of the Council, to consider the question of sending additional copies of the Journal to directors and curators of Museums and Botanical Gardens. At the present time the Journal was distributed very liberally and he himself had furnished several names of persons of the character referred to, to whom it should be sent; but he thought if the Committee went into the subject systematically, the distribution might be a little extended with great benefit.

The PRESIDENT said he would bring the matter before the Committee at its next meeting.

GENERAL PURPOSES.

The report of this Committee included the usual letter from the Solicitor stating the progress of cases which had been placed in his hands.

Two other cases had been considered by the Committee and in one case proceedings were recommended.

The Council, as usual, went into committee to con-

sider this report, and after a long discussion on a case of appeal from the Registrar's decision not to place the name of an applicant on the Register, the report and recommendations were adopted.

PRELIMINARY EXAMINATION.

It was resolved that the following certificates be received in lieu of the Preliminary examination :—

The Entrance Examination in Arts of the Faculty of Medicine in the Victoria University.

The Preliminary Examination of the Victoria University.

The Junior Students' General Examination of Owens College.

ANALYSES OF CINCHONA BARKS.

The PRESIDENT said he had received a communication from Dr. Paul, which would be published in the Journal, containing a report of analyses he had made of the samples of cinchona bark presented to the Museum by the Secretary of State for India

It was moved by the VICE-PRESIDENT, seconded by Mr. BOTTLE and unanimously resolved—

"That the best thanks of this Council be given to Dr. Paul for the analyses of bark made by him, and which are of so much interest in connection with the specimens presented to the Society's Museum by the Secretary of State for India."

REPORTS OF COMMITTEES—*continued.*

LAW AND PARLIAMENTARY.

The report of this Committee stated that the President had given to it an account of the action he had taken since the last meeting with reference to the draft Pharmacy Bill now in the hands of the Government.

A resolution had been moved in the Committee that immediate steps be taken to organize a deputation to the Lord President of the Privy Council, which had not, however, been carried.

The Council went into Committee whilst the President gave further details on the above subject.

The Council having resumed, it was moved and seconded—

"That the report of the Law and Parliamentary Committee be received and adopted."

Mr. HAMPSON said he thought the Council had now arrived at an important crisis with respect to the Bill which had been submitted to the Government, and it was quite time the Council should take the initiative in the matter. It had been well represented by the President, and personally the members of the Council felt obliged to him for his activity and zeal, but he believed his hands would be strengthened if the Council publicly expressed its desire to obtain the ear of the Lord President of the Council on this subject. At the Committee on the previous day he had moved a resolution that the Lord President be asked to receive a deputation, so that an opportunity might be afforded to press the claims of pharmacy on his lordship, but that proposal was not accepted. He would, therefore, move—

"That the report of the Law and Parliamentary Committee be received and that the Lord President of the Council be asked to receive a deputation with respect to the draft Pharmacy Bill sent to the Privy Council in February last."

The Council of the Irish Society was moving in the matter, and was anxious that the law in that country should be altered. In England it had been discovered long ago that the Pharmacy Act was defective, and in the interest of the public as well as pharmacy it behoved the Council to take some public steps in the matter.

Mr. YOUNG hoped it would not be needful to have an amendment, because he thought all would agree to this suggestion. He knew the amount of labour the President had bestowed on the matter, and should be satisfied to leave it very much in his hands; but still it was the usual way in this country if you wanted anything to show that you were really in earnest about it. He had been lately struck in reading the life of Lord Palmerston, for in some of his letters he gave accounts of various subjects in connection with his own particular sphere of duty, and referred to the pressure put upon him by different parties. It seemed to him also that he was very much guided by the kind of pressure brought to bear. As an illustration, not long ago, Lord Randolph Churchill, at Edinburgh, seemed to think that it was not necessary to make any more concessions with regard to the franchise, because there were no great meetings or petitions to Parliament about it. He believed that an influential deputation supported by local members of Parliament would have a good effect.

Mr. GREENISH also thought the time had arrived when some application should be made to the Lord President with regard to the Pharmacy Bill, and the question arose whether it should be done by the President or by a deputation. He was very much in favour of the old-fashioned mode of deputation, consisting not only of the President and members of the Council, but influential men from different parts of the country. He took it, of course, that the deputation might be introduced by members of Parliament.

Mr. SYMES said it was not from any dissatisfaction with the way in which the President had dealt with the matter that he supported the amendment. The President had done an immense deal in the business, but the time had arrived when something additional should be done. He thought it would be very useful to have an influential deputation such as was suggested, especially if it were carried out early in the session.

Mr. HILLS said it was the general feeling that there should be a deputation, but the feeling of the Committee appeared to be that Lord Carlingford would be better prepared to inform them what course the Government would be likely to take in two or three weeks than he was at present.

Mr. WILLIAMS said he had voted for an immediate deputation and was still convinced that that was the proper course to take. The Council should not wait for Lord Carlingford to move, but should endeavour to move him. The only question which arose incidentally was, whether the deputation should consist of members of the Council only, or should be strengthened from outside.

Mr. SYMES said that could be decided when the Council got a reply.

Mr. BOTTLE recommended a deputation entirely composed of members of the Council. If the Council went outside its own body to get up a large deputation it would look as if an attempt were being made to put pressure on the Government. He believed the Council was bound to its constituents to introduce the Bill in the next session, and in order to do that it wanted to know from the Government whether it was prepared to take up the matter or whether the Council must act independently. The great point was to get the Bill introduced, because if it were deferred the interest which had been awakened during the last five months would die out. He believed there was a large feeling of public interest in favour of amending the law and also amongst medical men, so that there would be a prospect of getting the measure through if it were introduced early in the session. The first thing to know was what the Government intended to do.

Mr. SAVAGE thought a deputation from the Council would be the most appropriate.

The PRESIDENT said the principal point seemed to be whether anyone outside the Council should join the deputation. Perhaps the Council would leave the details in the hands of the Law and Parliamentary Committee to arrange.

Mr. BOTTLE thought the Council should appoint the deputation.

Mr. HAMPSON said it would be well for the Committee, who would have to arrange for the deputation, to under-

stand what character it should assume. He was anxious that it should be such as to impress the Lord President of the Council with the importance of the question. On the previous evening someone suggested that the presence of a number of medical men would be important, but he should rather like the Council, if it had confidence in the Committee, to leave the arrangements in its hands. If the deputation was very small it would not be so impressive. It might be strengthened by medical men, members of Parliament, coroners, and so on.

Mr. SCHACHT said if there were too many persons present there might be a risk of having conflicting views.

Mr. GREENISH thought if there were medical men and coroners who had not gone into the various questions thoroughly with the deputation, these persons would be very likely to express views with which the Council could not agree.

The PRESIDENT said he believed that members of Parliament who introduced a deputation were not regarded as part of it.

The VICE-PRESIDENT thought the Council should settle the principle and leave details to the Committee. He did not think it advisable to have a very large deputation for fear of having varied opinions. He should prefer to have as influential a deputation as possible from their own body.

Mr. YOUNG thought it would be right for the Council to nominate the deputation, but it would be well if it were strengthened by gentlemen from different parts of the country. The Committee would take care that the views expressed were in consonance with the Pharmacy Bill which had been drawn up.

Mr. ROBBINS thought it would be very well for different parts of the country to be represented, but better representatives could not be found than those who sat on that Council.

Mr. SCHACHT thought the desire was rather to discuss with the Government whether it would or would not take this matter up from the chemists and druggists' point of view, and it seemed to him it would be rather hindering a free expression of opinion on the part of the minister if the Council were to go accompanied by members of Parliament or any other section of society outside its own particular organization. So far the Council had been in semi-confidential communication with the department, and what was wanted now was to urge upon it the pushing forward of this Bill during the present session. It was hardly desired to urge the matter or bring upon Government that kind of pressure which would imply that there was a large public demand. He doubted whether it would be wise to do more than have a well-selected representative deputation from the Council to confer confidentially with the department as to what might be expected. If the deputation got the cold shoulder it might then be necessary to use a little pressure from without, and under those circumstances outside agitation might be of great service, but he did not think the present was the right time for that purpose. There might be a few points which would require alteration, and he should not like to put any trammels on the utterances of the minister who was approached.

The Council here went into Committee to further discuss this subject. On resuming, the amendment was put and carried in the following form:—

"That the Report of the Law and Parliamentary Committee be received, and that the Lord President of the Council be asked to receive a deputation with respect to the draft Pharmacy Bill sent to the Privy Council in February last. That the members of the deputation and details be left to the Law and Parliamentary Committee to arrange."

DIVISION LISTS.

Mr. GREENISH then moved the following resolution:—

"That the names of the voters for or against any resolution submitted to this Council be published in the Journal reports of the proceedings."

He said his object in moving this was to correct some of the irregularity which had appeared to him to occur in the proceedings. About 1873, Mr. Hampson had proposed a similar resolution, which was considered right and proper, but the Council thought it would be drawing too hard and fast a line. His simple object was to do away with the irregularity. It would have been noticed by members of Council that it was possible to express opinions on a particular subject in language characterized by a felicity of ambiguity which left nothing to be desired, except the knowledge of which way the speaker intended to vote. At the present time every member of the Council saw which way his colleagues voted, but those outside who read the reports did not see which way the members recorded their votes, and as they now possessed the glorious institution of reporting the proceedings of the Council it was right that their constituents should see exactly not only what was said, but which way the persons speaking voted. It would have also a beneficial effect another way. He had observed occasionally that calling for the names had had the most paralysing influence on some members, so that they were utterly unable to hold up their hands. If this rule were general it would reconcile them to the regular reporting of the votes as well as to the remarks which were made. He believed it would be an advantage in every way to have the votes recorded, but he did not like it left to members to call for votes on particular occasions.

Mr. HAMPSON seconded the motion. He thought it would possibly give weight to the proceedings, and those whose votes were recorded might perhaps give a little more consideration to the questions which were discussed, whilst it would do away with any distinction between names being taken at one time and not at another.

Mr. GOSTLING supported the motion. It always appeared to him disagreeable when a little feeling was introduced into the discussion for gentlemen to rise and call for the names to be recorded.

The PRESIDENT said he did not see much harm in the motion, but he thought it would be very inconvenient at times, and it might lead members to call for a ballot under certain circumstances, which they could do under the bye-laws. It was a constitutional practice to take a show of hands, and then, if the decision were challenged, to divide and take the names. He did not think there was anything unconstitutional in the present practice, or anything which did any serious harm. There were occasions, such as the appointment of officers, and others which he could not call to mind at the moment, where it would be inexpedient to publish names. He would rather leave the matter to the good sense of the Council in each case.

Mr. WILLIAMS said there was no doubt it would delay the business. It had always been the practice for any member to have the names taken down if he desired, but he was not aware that it had ever led to any great show of feeling. There might be instances, but it did not last long. If it was held that it looked invidious for a member to call for names to be taken down in a division, by all means adopt the motion. If, also, it was considered necessary that their constituents should know exactly how they voted on every little insignificant occasion, it was another argument in favour of it, but he did not think it was so essential. The names were always taken down in every division of consequence.

Mr. BOTTLE thought an equal amount of inconvenience and personality would arise if this motion were carried. It had occurred to him that if there was a desire that the names should be published, that it should be called for before the division took place. In practice it was otherwise; a show of hands was taken, and then someone who was disappointed at the result asked that the names should be taken down.

Mr. SCHACHT thought it would be wise to have a rule and keep to it. That was the great recommendation of Mr. Greenish's motion.

The PRESIDENT said there was a rule now, and a constitutional one.

Mr. SCHACHT said where there was no division no loss of time would take place; but when it came to a question where there was a difference of opinion the taking down of names would not occupy much time. If it were a delicate point, such as had been referred to, it would be easy to introduced the ballot. He agreed that it was rather disagreeable because a man thought he was going to be beaten that he should call for the names to be recorded as a sort of threat. He never paid any attention to it, but it was an offensive thing to hear.

Mr. GREENISH said all he desired was that there should be some regularity in the proceedings. He did not care if the names were never taken; but he did not wish it to be in the hands of any members to call for the names at any particular time, when they would not in the ordinary course be taken, thus giving special prominence to a subject which might not deserve it. He had no wish to press the motion on the Council.

Mr. YOUNG thought perhaps Mr. Greenish would be content with having broached the subject.

The PRESIDENT thought it might have the effect desired.

Mr. SCHACHT did not think it would.

The PRESIDENT said that if names were called for in any invidious manner the matter could easily be balanced by calling for the names in other cases, but he did desire to impress upon the Council that it was unwise to introduce unnecessary restrictions in the conduct of business.

Mr. GREENISH withdrew the motion.

REPORT OF EXAMINATIONS.

December, 1883.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major (12th)	6	4	2
„ (13th)	7	4	3
„ (19th)	6	4	2
	— 19	—12	—7
Minor (12th)	21	5	16
„ (13th)	23	5	18
„ (19th)	22	6	16
„ (20th)	27	14	13
	— 93	—30	—63
Modified (12th) . . .	2	1	1
	114	43	71

Preliminary Examination.

Twelve certificates received in lieu of the Society's examination.

2 College of Preceptors.
1 Society of Apothecaries.
5 University of Cambridge.
4 „ „ Oxford.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council was held on Wednesday, January 2; the President, Mr. James E. Brunker, M.A., in the chair.

Present:—The Vice-President, Mr. H. N. Draper, F.C.S.; Drs. Collins, Montgomery; Professor Tichborne, Ph.D.; Messrs. Allen, Doran (Bray), John Evans, Grindley, Hayes, Hodgson, McIlwain, Pring (Belfast), Simpson and Wells.

A letter was read from Mr. James N. Hardy, L.P.S., Dublin, calling attention to his former correspondence in reference to a legal point arising on the Pharmacy Act, and pressing for a reply.

The Registrar (Mr. Fennell) said queries arising on Mr. Hardy's letter had been submitted, about two months ago, for the opinion of Mr. Naish, Q.C., Attorney General for Ireland. As yet, however, the learned counsel had not given his opinion.

It was resolved that the Registrar be instructed to communicate with Mr. Naish, asking him to expedite his reply to the queries, and that Mr. Hardy be informed of the steps that had been taken.

Mr. W. H. Brown, of Portadown, wrote inquiring whether the certificate of the Intermediate Education Board would be accepted by the Pharmaceutical Society as an equivalent for their Preliminary examination.

Dr. Collins said that this matter had been discussed by the Councils of the Apothecaries' Hall and the College of Surgeons, and the result was that at both these institutions they had resolved to discontinue their Preliminary examinations and to accept in lieu of them, for the future, the certificates of the Education Board that the candidate had passed in the several subjects required.

Mr. Draper observed, Mr. Brown's letter made no mention of botany, which was one of the subjects required for the Preliminary examination of the Pharmaceutical Society.

Dr. Collins: Of course you will not accept a certificate which does not include all the subjects.

The President: Mr. Brown states in his letter that the Intermediate Education Board do not hold any examination in botany for boys.

Dr. Montgomery apprehended that settled the matter. He proposed that the Council decline to accept the certificate referred to, as it did not include all the subjects mentioned in the curriculum.

Mr. Simpson seconded the motion, which was agreed to.

The President read a letter from Mr. Trevelyan, M.P., Chief Secretary for Ireland, as follows:—

"Chief Secretary's Office, Dublin Castle.

"*December* 27, 1883.

"Sir,—I beg to acknowledge the receipt of your letter of the 24th instant and, in reply, to say that I shall be happy to receive a deputation from the Pharmaceutical Society of Ireland, on Tuesday, January 8, at 1 o'clock p.m.

"Yours faithfully,

"G. O. TREVELYAN."

The President said that as he had a notice of motion on the agenda paper in reference to this deputation, he would ask the Vice-President to take the chair while the matter was being discussed.

The Vice-President (Mr. H. N. Draper) then took the chair and—

Mr. Brunker (President) moved—

"That it be an instruction to the deputation about to wait upon the Chief Secretary, to recommend that in any amendment of the law affecting pharmacy or the sale of poisons in Ireland, power shall be given to this Society to license, by examination, a grade of registered druggists, who shall be empowered to sell poisons but not to dispense prescriptions."

He would very much prefer some other member of the Council had brought this question before them, but as no other member had done so he had given the notice in order to bring the matter up for discussion. From what occurred at their last meeting it was necessary the question should be settled one way or other. Until that meeting he was unaware it was such a "burning question" as it appeared to be, or that there was so much difference of opinion upon it. On two occasions, at all events, the Council had expressed a strong opinion upon it and he would have thought that if amongst the general body of the Society there was any strong opposition to it,

the opposition would have found expression at the annual meeting, but so far from that, the annual meeting consisted only of the members of the Council and two outside members, which certainly would lead one to suppose there was not any strong opinion held by the outside members on the subject. The matter was before a committee four years ago who, after very full consideration, recommended the establishment of a new grade of druggists, as well as the registration of all existing chemists and druggists who were entitled to continue the sale of poisons under the Act. That proposition was adopted by the Council, but was rejected by the Society at its annual meeting four years ago. The question came again before the Council last year, and, again, the opinion of the great majority was in favour of establishing such a grade as that referred to. He would, in the first instance, observe that this Society was not founded as a Trade Protection Society in any sense of the word. It was formed in order to administer the law as it existed, and if there was any defect in the existing law to suggest a remedy. Now the opinion of every member of the Council he believed was that some change was required. There was no difference of opinion as to the necessity of registering those persons who by the existing Act were entitled, although unqualified, to continue the sale of poisons; but there was a difference of opinion as to the perpetuation of that grade. For his part he (Mr. Brunker) thought the grade ought to be perpetuated with some restrictions and modifications. This Society could not at its present rate of going supply the wants of the public throughout the country. They had on their roll 251 licentiates, but deducting those who were out of the country, the actual number was only about 220. Of those he believed not more than half were in business on their own account, and allowing for those who were residing in Dublin, Belfast, and Cork, they had not at the outside more than between 40 and 50 men qualified as licentiates of the Society to supply the wants of over two hundred towns in Ireland of upwards of 1000 inhabitants. At their present rate of going, therefore, the Society could not for many years supply every town with a qualified pharmacist; and the question arose, would it not be advisable an educated man should be appointed for those towns and villages? There was no doubt whatever the people in those localities wanted men who could sell them such drugs as a pennyworth of arsenic or an ounce of laudanum, and the object of establishing the proposed grade of druggists was that the public should have a guarantee that the persons who sold those things should understand what they were selling—that they should at all events know the difference, for example, between corrosive sublimate and washing soda. He believed at the present day there were hundreds engaged in the trade throughout the country (from the representations the Council had got in reply to their queries) who did not even know that, and the public were completely at the mercy of those people. There were one or two arguments which he believed would be urged against the proposition; one was that when the Society was founded they decided on only having one grade. He, however, did not think that affected the question, for even if they had established two grades of members, the members of both grades would have had the same rights, and both would be entitled to dispense prescriptions, the only difference they could make between them would be that which existed in England, viz., a difference in the standard of examination. Now he did not think any member of the Council would say the Society would be justified in turning men loose on the country to dispense prescriptions on a lower standard of examination than they had at present, nor did he believe that even if they had a higher grade they would find many availing themselves of it. Another argument which certainly possessed some weight was that the establishment of the proposed grade of druggists might tend to encourage illegal dispensing, but he believed that could be avoided by efficient registration. He would suggest that those persons who entered the proposed grade should be required to pay a small annual licence—if it were even as low as 2*s.* 6*d.*—and that lists of those licensed persons should be furnished to the police authorities, so that in each district the police would know who were licensed to sell poisons and who were not.

Mr. Pring (Belfast), in seconding the motion, said after the Pharmacy Act became law they had a discussion in the Council as to the desirability of having two grades of members, but it was decided to have only one, the chief argument being that under their Act as it stood, if they formed two grades they would both possess the same legal rights as to dispensing prescriptions, the only difference would be that a man in the second grade could not call himself a pharmaceutical chemist, but might style himself "chemist and druggist." He (Mr. Pring) believed that it was illegal for a druggist to sell poisons, if they went by the strict letter of the law. He knew a great number of persons in Belfast who considered it a great hardship that the Society had not a second grade of licentiates such as that now proposed—a grade of persons licensed to sell drugs. A great many persons wished to become druggists—to acquire the legal right to sell poisons—who yet did not want to dispense prescriptions; but as the law now stood they must become pharmaceutical chemists, and, in fact, take out a qualification they did not want. For these reasons he seconded the proposition.

Mr. Grindley moved the following amendment:—

> "That inasmuch as the majority of the licentiates of the Pharmaceutical Society of Ireland are of opinion that the proposed grade of registered druggists should include only those at present in business, and should not be extended by examination or otherwise to more than those at present keeping open shop as chemists and druggists, this Council shall not seek power to register such persons for the sale of poisons in Ireland beyond those at present in business."

The meeting of Council at which the proposition to establish this new grade was adopted was attended by only a few members, and it was not unanimous, for the matter was strenuously opposed by two of the members present. He thought this question ought not to be raised at all at any Council meeting, inasmuch as at the Society's annual meeting in October, 1869, it was settled that the grade of registered druggists should not be perpetuated. Of course all existing chemists and druggists,—those who were in business at the time of the passing of the Act,—were entitled to their rights and would not be interfered with; but he (Mr. Grindley) and the body of licentiates for whom he appeared objected *in toto* to this class being perpetuated, as the fact of being licensed to sell poisons would include the right to sell other drugs and would destroy any chance their regularly qualified licentiates had of living. The Act was passed to supply the public with a class of men properly qualified to dispense drugs and compound prescriptions, but if they now established this third grade of men their licentiates would be deprived of all chance of living.

Mr. Pring: What do you mean by a third grade?

Mr. Grindley: There were first the existing "chemists and druggists," those who were in business when the Act passed; secondly, there would be this new grade of registered druggists; and lastly, there were their own regular licentiates, and how were these latter to live if this proposal was carried out? Every man who had passed the Society's examination as a pharmaceutical chemist had expended his time and money on the faith that the Society would protect him and in the belief that only one grade would be established, and never would have gone in for examination if he thought this class of "chemists and druggists" was to be perpetuated. The

great majority of their licentiates were opposed to the proposition and between one hundred and forty and one hundred and fifty of them had memorialized the Lord Lieutenant against it.

Mr. Wells seconded the amendment, as he believed the proposition would, if carried out, be destructive of the interests of the great body of the Society's licentiates, injurious to the Society itself and detrimental to the public. The Society had already at one of their annual meetings rejected the proposal. When the matter was brought forward again at a recent meeting of the Council it was not properly explained in the notice paper, and the consequence was only nine or ten members of the Council attended out of the total of twenty-one members. Mr. Grindley and he (Mr. Wells) opposed it at that meeting, but the other seven or eight members present voted for it. Under those circumstances Mr. Grindley and he determined to bring the matter before a meeting of the Society's licentiates in Dublin and let them know what the Council proposed to do. Forty licentiates attended that meeting and were unanimously against it. They also sent circulars to the licentiates in the country, the result being that nearly one hundred and fifty signatures had been affixed to the memorial referred to by Mr. Grindley. He believed the establishment of the proposed class of druggists would increase illicit dispensing Illicit dispensing and compounding were carried on at present, and the Society was unable to prevent it; but if this new class of traders who could style themselves "registered druggists" were established, how could the public distinguish between them and the fully qualified chemist? The result would be the Society would dwindle away. They might have qualified pharmaceutical chemists in the large towns, but in small towns and villages men would not deem it worth while obtaining the qualification for the small advantage they could get by it. The pharmaceutical chemist would be regarded by the public, especially in small towns, much in the same light as people formerly regarded the apothecaries—as persons who charged "tall" prices—and they would suppose the druggist would sell more cheaply and give him their custom. As to the argument that by this proposal they would have a class of educated persons to sell drugs and poisons in the country, the proposition was that they should be examined in the nature and appearance of certain poisonous drugs and chemicals, but he (Mr. Wells) failed to see how that would secure a grade of educated men. Any person with brains could in a short time learn that much; yet that was all that it was proposed to require of him; he need not even know how to write his name. His belief was that the Act as it existed was gradually supplying the country with educated and qualified men to dispense drugs, and numbers of country towns where there never was a qualified dispenser before the Act was passed had one now. In a few years if they continued their system every town in Ireland would have a qualified chemist. He did not see any reason why the sale of poisons should be entrusted to a man who was unfit to make up prescriptions. The better qualified a man was the more careful he was likely to be in dealing with dangerous drugs. At present they heard of arsenic and other poisons being sold in country towns by grocers who were unable to write their names.

Mr. Pring: We want to take the sale out of the hands of such persons.

Mr. Wells said that was all right. He and those whom he represented did not object to that at all. What they objected to was the proposed perpetuation of an inferior grade of sellers of drugs. What they asked was that the names of all existing druggists should be registered, and that while leaving their rights untouched, the Act should provide against the perpetuation of that class of traders.

The Vice-President: Why do you propose to recognize them at present and not continue them?

Mr. Wells: Because you cannot interfere with the existing rights of persons in business. What we say is, register the names of all existing persons in the trade, and then if any unqualified person attempts to sell in future, you can prosecute him. One difficulty the Society has in prosecuting unqualified persons is, because there was no registration of the existing druggists when the Act first became law. Mr. Wells concluded by seconding the amendment.

Professor Tichborne thought as regarded the merits of the proposition there was a good deal to be said for and against. He quite agreed with the remark that in large towns it might be an inducement to illegal compounding, for no doubt many people—especially the lower orders—would not discriminate between a licensed druggist and a qualified pharmaceutical chemist. On the other hand there was no question there were many small towns in Ireland where there was neither an apothecary nor a pharmaceutical chemist keeping an open shop for sale of medicines, and there was no use passing a law which it was impossible to carry out. There must be some people in small towns and villages to sell poisons. Would it not meet the difficulty if it were provided that on a requisition stating that there was no licentiate or qualified man keeping open shop in a town for sale of drugs, the Society should in such cases have the power of licensing a druggist to sell poisons in such town? The first thing they had to consider was whether it was necessary, and if so they ought to ask for it in the interests of the public. That was the light in which Government would regard the question, apart from the interest of any body of men.

Mr. Hodgson observed that if what Mr. Wells proposed was carried out it would be wholly contrary to the spirit of the age, which was decidedly opposed to anything approaching a monopoly. He would never be a party to establishing a huge monopoly, and it never was the intention of the framers of the Act that there should be a monopoly for the sale of drugs and poisons in the hands of the pharmaceutical chemists.

Dr. Collins spoke in favour of the proposition, and observed that ten years ago, when the Pharmacy Bill was before the country, the trade was then quite favourable to what they were now opposing—the establishment of a second grade of druggists—licensed merely to sell, and not to compound medicines.

Mr. Evans said he had received a letter from Mr. Lester, of Cork, who believed the proposed grade would ruin the business of pharmaceutical chemists in small sowns. They would have a lot of half-qualified men telling at ridiculously low prices. He believed the establishmeat of the proposed grade of druggists would be a great mistake.

Dr. Montgomery said the Government would have to look at the question, not from the pharmaceutical chemist's point of view, but in the interests of the public. He believed it would be for the public advantage to have a grade of men qualified to sell poisons, though they might not possess qualifications enabling them to compound prescriptions.

Mr. Simpson said if a man was not sufficiently qualified to compound medicines he was unfit to deal in poisons, for he was ignorant of the character of the articles he was dealing in, and it was unsafe to entrust such a man with the power of selling poisonous drugs. He regarded it as a most unfortunate thing that there was not a registration of the existing chemists and druggists when the Pharmacy Act became law. If that had been done they would not be in the condition they were in now. He intended to vote for the amendment.

The President replied to the observations of the previous speakers, and said of course it was not intended to give any man the proposed new grade of registered druggist unless he could show that he possessed a fair amount of education, besides some technical knowledge of poisons and potent drugs. With regard to Professor Tichborne's

suggestion, he quite concurred in the spirit of it, and if he were asked to suggest details, that would be one he would strongly recommend for consideration. If any Bill, however, were introduced at all, it would be a Government Bill, and though of course the framers of it would be likely to consult the opinion of the Council of the Society as to the details of the measure, they would act on their own views and frame such clauses as they thought best in the interests of the public, for this matter must not be regarded in the light of a trade protection question, but as a public question in which all classes of the people were interested.

The votes were:—

For the amendment.—Messrs. Allen, Doran, Evans, Grindley, McIlwaine, Simpson, Wells.—7.

For the original proposition.—The President, the Vice-President, Dr. Collins, Dr. Montgomery, Messrs. Hayes, Hodgson, Pring, Tichborne.—8.

The amendment was therefore lost. The President's proposition was then put, and carried.

A discussion ensued as to the procedure to be adopted upon the proposed deputation to the Chief Secretary, and it was resolved that the President and Dr. Collins should be the speakers to state the views of the majority of the Council, but that as many members of Council should be requested to attend on the deputation as could find it convenient to do so.

In consequence of the lateness of the hour, the remaining business on the paper was adjourned to the next monthly meeting.

Obituary.

Notice has been received of the death of the following:—

On the 5th of December, Mr. John Tribe, Pharmaceutical Chemist, High Street, Chatham. Aged 78 years. Mr. Tribe long held a prominent position in the municipality of Chatham, having, among other offices, filled those of Alderman and Mayor. He was one of the Founders of the Pharmaceutical Society, and served it during several years as a Local Secretary.

On the 8th of December, Mr. William Henry Jackson, Chemist and Druggist, Sutton, Surrey. Aged 57 years.

On the 9th of December, Mr. James Edward Wheeler, Pharmaceutical Chemist, Upper Tollington Park, N. Aged 69 years. Mr. Wheeler had been a Member of the Pharmaceutical Society since 1846.

On the 22nd of December, Mr. Alfred Wright Hardcastle, Chemist and Druggist, Finkle Street, Stockton-on-Tees. Aged 35 years. Mr. Hardcastle had been an Associate of the Pharmaceutical Society since 1873.

On the 23rd of December, Mr. Timothy Grisdale, Chemist and Druggist, Market Street, West Houghton. Aged 48 years.

On the 24th of December, Mr. Edwin Cridland, Chemist and Druggist, Stradbroke, Suffolk. Aged 55 years.

On the 25th of December, Mr. John Ransome Oxley, Chemist and Druggist, Market Hill, Sudbury. Aged 70 years.

On the 25th of December, Mr. John Walton, Pharmaceutical Chemist, High Street West, Sunderland. Aged 61 years. Mr. Walton had been a Member of the Pharmaceutical Society since 1848.

On the 29th of December, Mr. Alfred Uriah Row, Chemist and Druggist, Fore Street, Devonport. Aged 47 years.

On the 30th of December, Mr. George Stuart, Chemist and Druggist, Penny Street, Lancaster. Aged 24 years. Mr. Stuart was an Associate of the Pharmaceutical Society.

On the 1st of January, Mr. Robert Rowell, Chemist nd Druggist, Green Street, South Shields. Aged 47 years. Mr. Rowell had been a Member of the Pharmaceutical Society since 1874.

On the 3rd of January, Mr. Joshua Broughton, Chemist and Druggist, High Street, Wrexham. Aged 75 years.

BOOK RECEIVED.

THE DRUGGISTS' POCKET PRICE BOOK, for Retailers, Jobbers, Manufacturers and Travelling Salesmen. Third Edition. By BENJAMIN LILLARD. New York: J. H. Vail and Co., 1883.

Correspondence.

PATENT MEDICINES CONTAINING POISON.

Sir,—Another case of child poisoning by a patent medicine has lately been reported. Holt's specific for whooping-cough was taken, and it is said to contain antimony. The jury very properly desired to call the attention of the Home Secretary to the sale of patent medicines.

The indiscriminate sale of such medicines, some of which are known to contain opium, antimony, and other potent and deleterious ingredients, is a crying evil, and surely demands the intervention of some law in the matter, either to prohibit altogether or to regulate.

Dispensing chemists ought to co-operate with members of the medical profession and represent to the proper quarter the great danger and unfairness of allowing grocers, oilmen, and others, to sell medicines of which they know absolutely nothing.

It should be enacted that the manufacturers of patent medicines be compelled to state on their bottles whether or not their preparations contain any ingredients dangerous in themselves, or that might prove so in an increased dose; and the retailers of such medicines, who ought to be licensed chemists and no others, would be able to warn purchasers as to the nature of the medicines bought.

Or a more sweeping and justifiable enactment might be made prohibiting manufacturers of patent medicines from making up any ingredients whatever of the nature of what comes under the category of poisons. Why are the makers of patent medicines not held responsible for the melancholy results which sometimes ensue from taking their mixtures? A licensed chemist or medical man would not get off so easily, if a mistake were committed in regard to the dispensing of medicine. An unaccountable leniency is displayed toward the quack.

Let chemists, then, join with medical men in representing this flagrant abuse, and urge the State to interpose on behalf of the innocent beings who are victimized by patent so-called specifics, by herbalists who give poisonous doses of lobelia, as in a case recently recorded, and by unprincipled quacks.

On looking at the list of patent medicine manufacturers, etc., I am astonished at the number who are in no way connected with pharmacy or medicine.

ROBERT CONNELL, M.D.

"*Druggist.*"—If possible the prescriber should be consulted.

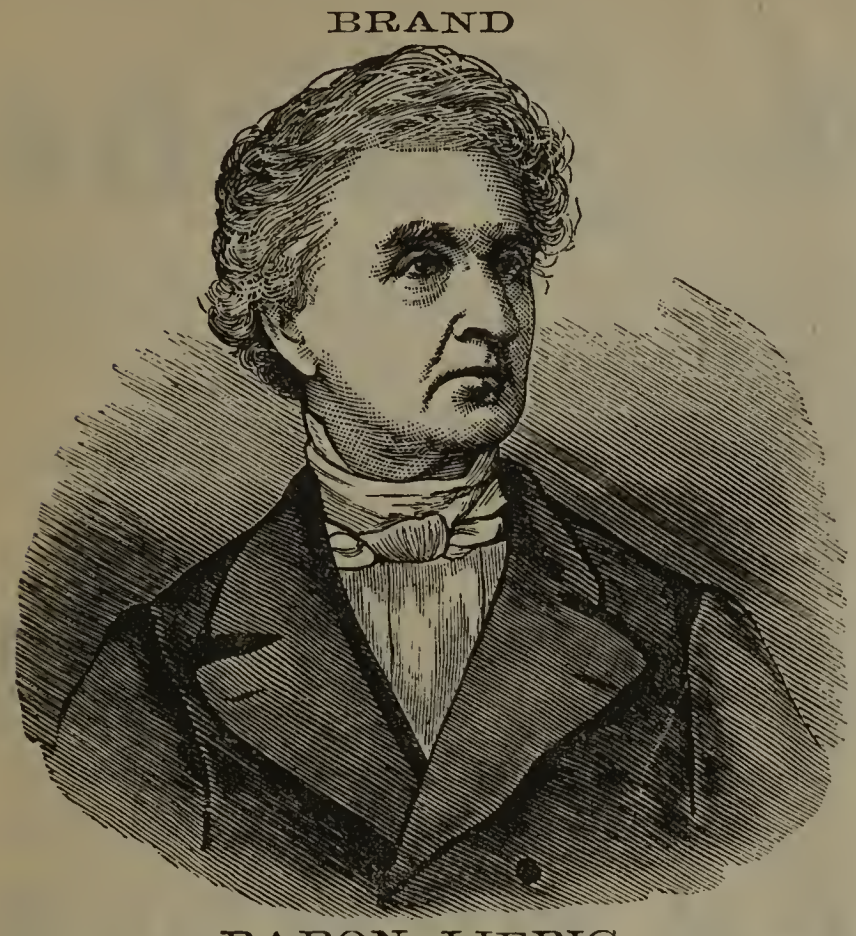
"*Associate.*"—The substance mentioned is not included in the schedule of poisons.

J. W. S.—Mr. Warren's paper was printed *in extenso* in the *Journal of the Society of Arts* for December 7.

"*Tr. Card. Co.*"—Try Attfield's 'Manual;' but you should remember that chemical experiments and the writing of equations are only useful as means to an end, and are dealt with from this point of view in all good works on chemistry.

"*Coccus.*"—*Liquid Cochineal.*—The following formula is said to yield a preparation that will keep well:—Cocci cacti, potass. carb., potass. tart. acid., pulv. aluminis, āā ℥j; aquæ, ℥viij. Boil the cochineal, carbonate of potassium and water together, then add the alum and acid tartrate of potassium; when cold add half a drachm of rectified spirit to each ounce and filter.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Clagur, Robinson, Abraham, Howard, Martin, Hodgson, Apprentice.



BARON LIEBIG.

BARON LIEBIG'S EXTRACT of MEAT

N.B.—Each Jar bears the Likeness of the Inventor, the late Baron Justus von Liebig.

Orders for Extract in Bulk or Jars will have my best attention. Wishing the Trade a Happy and very Prosperous New Year,

I am, yours faithfully,

R. W. ANDERSON,

Sole Proprietor of Brand "BARON LIEBIG" Extract of Meat.

92, Upper Thames Street, London, E.C.

LIEBIG'S EXTRACT OF MEAT CO. (Limited) v. R. W. ANDERSON.

The following are passages from the Judgments of the Judges who heard the Actions:

The HON. MR. JUSTICE FIELD.

"A man has a right, as far as I can understand, to carry on his business so long as he does not interfere with the rights of anybody else."

"There is no suggestion here that Anderson's Extract is anything but a *bonâ fide* article - indeed, *one of the witnesses for the plaintiffs* said that the article was *so good* that one of his customers who had the article with the Photograph Brand came back and said he wanted some more of that brand."

"The plaintiff Company, it will be observed, had never used the word 'Baron,' and they had never used a picture of any sort or kind."

"*My judgment will be for the defendant, with costs.*"

LORD JUSTICE LINDLEY

"was of the same opinion. Extract of meat was called 'Liebig's Extract of Meat,' and that name had become common property. It was an expression which was applied to a certain article, and the article was known by that description in the trade, and anybody could make it and advertise and sell it under that name. The plaintiff Company had tried to rely on something which was evanescent and shadowy. The evidence, in his opinion, was insufficient for the Court to say there was any practical difference between the words 'Baron Liebig's Extract of Meat' and 'Liebig's Extract of Meat,' as it had been shown that 'Liebig's Extract of Meat' was also sometimes called 'Baron Liebig's Extract of Meat.' The whole case came to this: if the defendant was entitled to use the words 'Liebig's Extract of Meat,' could the Court restrain him from using the words 'Baron Liebig's Extract of Meat'? It seemed to him that it was impossible to do that."

LORD JUSTICE COTTON

said "this was an appeal from a decision of Mr. Justice Field. By this action the plaintiff Company sought to restrain the defendant from using on a label on the pots and jars, which the defendant sells, of extract of meat made in accordance with Baron Liebig's receipt, the words 'Baron Liebig's Extract of Meat,' and also from using on his pots and jars a Photograph of Baron Liebig with the word 'Brand' above, and 'Baron Liebig' below. It was conceded that the plaintiff Company could not claim the words 'Liebig's Extract of Meat.' The name, therefore, was not the property of the plaintiff Company, even if the first maker of the article had been Liebig's Extract of Meat Company (Limited). The defendant here represented, not that the article he sold was manufactured by the plaintiff Company, but that he was a dealer in 'Baron Liebig's Extract of Meat.' He thought that the plaintiff Company's witnesses failed to make out that 'Baron Liebig's Extract of Meat' was a name that ought not to be given to describe extract of meat manufactured from the late Baron Liebig's formula. But if it was admitted that 'Liebig's Extract of Meat' would be a description of which the plaintiff Company could not complain, could the Court say that by the addition of the word 'Baron' and the Portrait the defendant represented his goods as being those manufactured by the plaintiff Company? In his opinion, the plaintiff Company had not made out that that was the case. Therefore, in his opinion, the plaintiff Company had failed to make out their case, and the decision of the learned judge in the Court below was right."

LORD JUSTICE FRY

"was entirely of the same opinion. It appeared to him that there was no infringement of trade mark in this case, and the question then arose, was there any infringement of a trade name? That point had been argued before the Court, and they had been told that the plaintiff Company's goods were distinguished in the market by the name of 'Baron Liebig's Extract of Meat,' whilst the goods of other manufacturers were known as 'Liebig's Extract of Meat.' In his opinion, however, the evidence did not support any such contention, and he thought, therefore, that in using the words 'Baron Liebig's Extract of Meat' the defendant had not infringed any trade name. The only question that remained was, had the defendant done anything by which he had endeavoured to do anything unfair in order to obtain the custom of the plaintiff Company? It had been shown that the words 'Brand' and 'Baron Liebig' had in no way deceived purchasers or made them believe that the goods they purchased were the goods manufactured by the plaintiff Company, and, that being the case, the appeal must be dismissed with costs."

The Four Judges were unanimous in R. W. Anderson's favour, and the Three Lords Justices so strongly so that they had no need to hear Anderson's Counsel speak!!!

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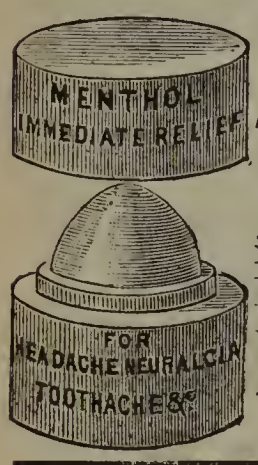

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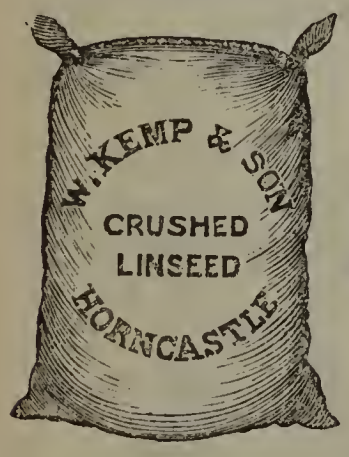

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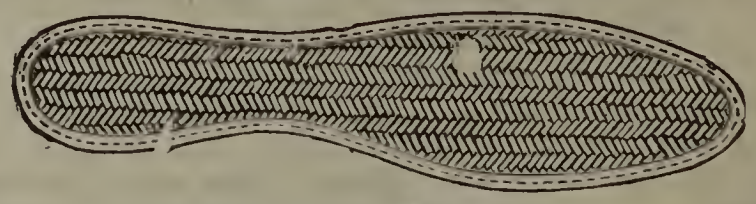

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„ T. S. CORNWELL. .....Penzance.
„ W. T. SERGENT..... .....Croydon.

MINOR.

*Mr. G. H. BRADFORD.....Bradford.
„ E. M. BROWN.....Derby.
* „ H. R. DORNING.....Chorley.
* „ E. H. TAYLOR.....Tonbridge.
* „ RICHARD BROWN.....Rochester.
* „ WALTER JACKSON.....Catterick.
* „ A. E. SMITH.....Sudbury.
„ R. H. PLAYFORD.....Horsham.
* „ CHAS. RAY.....Eastbourne.
* „ JOHN RICHARDSON.....Mansfield.
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Mr. C. BING	Mr. J. R. MOWATT
,, J. DOLBEAR	,, E. S. TAYLOR

The following Minor Candidates from this school were successful :—

Mr. W. BURGESS	Mr. E. PECK
,, ,, FOSTER	,, J. H. SHACKLOCK
,, J. T. JACKSON	,, R. J. SHANNON
,, E. MILLHOUSE	,, J. WOOD

The classes for the February and April examinations have now commenced. For prospectus, &c., apply to

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FOURTEENTH SESSION, 1883-4.

The Pharmaceutical Department, after having been closed for the Christmas Holidays, was re-opened on the 7th inst.

Entries now begun for the term commencing April 15th.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

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ASSISTANT. In or near London. Out-door preferred. 9 years' experience. Disengaged. STATIM, 73, Eversholt Rd., Crouch Hill, N.

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AS Assistant or Manager of Branch. In-door. London experience. Age 25. Minor qualification. London preferred. Chemicus, 62, Barkham Ter., Lambeth Rd., S.E.

AS Junior Assistant, in-door, in a good Dispensing business. South of England preferred. Minor qualification. Good reference. Age 23. H. B., Raleigh House, Ottery St. Mary, Devon.

BY a young gentleman, with Apothecaries and Minor qualifications, situation in a good general Family business, with prospect of early succession or partnership. J. R. W., Mr. F. Mason, Chemist, Rotherham.

AS Assistant or Manager of Branch. 5 years' experience. Good references. Age 22. G. E. Noble, Far Croft Ter., Tong Rd., near Leeds.

JUNIOR. Disengaged the beginning of February. 6 years' experience. Age 19. Christian and comfortable home required, if in-door. Excellent references. London preferred. H. W. Benest, Wesley St., Jersey.

WHOLESALE.—As Assistant. 3½ years in the Retail. Age 19. Disengaged. A. Gregory, 77, Upper Arundel St., Portsmouth.

AS Assistant, in a good Retail and Dispensing business. North of England preferred. Major qualification and good London experience. Walter S. Corder, 1, Carlton Ter., Sunderland.

AS Manager of Branch or as Assistant. Varied experience. Able to Extract Teeth. Accustomed to Dispensing, Prescribing and light Retail. Permanency desired. Theta, Mr. Sandiland's, Bicester, Oxford.

AS Junior, in good Dispensing business. London and country experience. London preferred. Pharmacy, 55, Pentonville Rd., N.

ADVERTISER, who is 21 years of age, and has had over 7 years' experience in Retail Pharmacy, requires an engagement as Traveller or Counterman in Wholesale Drug Store. Highest references. Lawson, 1, New Bridge St., Newcastle-on-Tyne.

AS out-door Assistant or Manager of Branch. Age 34. Qualified. Over 4 years in present situation. Good references. London or suburbs preferred. Chemist, 132, Clarendon Rd., Notting Hill, W.

AS Junior. In or out-door. Age 22. 5 years' experience. Good references. T. P. King, 54, Trinity St., Gainsborough.

AS Junior. Just finished apprenticeship. 4½ years' experience. Age 19. Height 5ft. 10in. Good references. H. Green, Hucknall Torkard, Notts.

WHOLESALE.—In London. As Wet or Dry Counterman. Well up in Pharmaceutical Preparations. Age 27. Good references. J. H., 83, Barnsdale Rd., Harrow Rd., London.

ASSISTANT. Large town preferred. 6 years' experience. Good Dispenser. Ætat. 21. Height 5ft. 7in. Excellent references. A. F. J., 1, Huntly Rd., Elm Park, Liverpool.

AS Assistant, in a good class Retail and Dispensing. Qualified. Competent Dispenser. Ætat. 27. Height 5ft. 8in. Disengaged. Full particulars to Minor, 28, Boro St., Brighton.

ENGAGEMENTS WANTED.

TRAVELLER.—By gentleman with a connection in the Midlands, West of England and Ireland, to represent a good firm. Highest references. Age 32. X. Y. Z., Mr. J. R. Day, 146, Lodge Lane, Liverpool.

AS Assistant. 11 years' town and country experience. Age 27. Height 5ft. 7in. Accustomed to a good class trade. Disengaged. J. E. G., 9, Shrubbery St., Kidderminster.

BY a Dentist. Good operator and mechanic. If required, will instruct, provide tools, and help in the shop. Satisfactory references. Terms moderate. C. G., 9, Lightburn Avenue, Ulverston.

EVENING, or part time employment. Well up in all branches. Terms moderate. References good. Disengaged. S., Yates & Co., Stationers, Dalston Lane, E., Dalston Junction.

ASSISTANT or Manager with Chemist and Dentist. Minor. 30. Single. Good Prescriber. Highest references. Can Extract Teeth. Instruction in Dentistry as part salary. Alpha, Geo. Moore, Jun., Burgh, Lincs.

AS Improver, in London, with time allowed for Minor study. Comfortable home and small salary. For particulars, Alpha, Western Mail Office, Cowbridge, Glam.

AS Improver in general trade. 2½ with Surgeon, short time with Chemist. Ætat. 25. Moderate salary to gain experience. Good references. Photo. Disengaged 19th. Chemicus, 31, Cottenham Rd., Holloway, N.

AS Assistant, where two or more are kept. London preferred. Age 25. Height 5ft. 8in. Minor qualification. Please state hours. Minor, 168, Piccadilly, W.

AS Improver, in or near London. 3 years' good experience. Moderate salary where a good knowledge of Dispensing could be obtained. O. M., Bishop, Stationer, Mare St., Hackney.

MR. WATTS wishes to apprentice his son, a tall, well educated youth, 16½ years of age, to a Pharmaceutical Chemist in town or country, where he will have every opportunity of acquiring a thorough knowledge of the business of a Chemist and Druggist. Has passed the Preliminary examination and can enter on his duties at once. Address, 217, Edgware Rd., London, W.

TEMPORARY. Ætat. 31. By day, week or month. Town or country. Thoroughly experienced in all branches. Disengaged. Irreproachable references. Terms moderate. A. Wood, 7, Woodfield Cres., W.

AS Assistant. Age 23. 7 years' experience. Knowledge of Dentistry. Major qualification. Excellent references. W. Longtoft, 124, Bridge Rd. West, Battersea, S.W.

AS Junior Assistant, in light Retail and Dispensing business, in London or suburbs. With time for study. Height 5ft. 8in. Age 20. Good reference. Disengaged. Tyler, Walton, Ipswich.

AS Assistant or Manager, in good class business. 20 years' suburban and country experience. Age 37. Qualified. W. S. Jones, 4, Suffolk Pl., Pall Mall, London.

AS Junior Assistant, in-door, where others are kept. Accustomed to select Dispensing and Retail. Good references. Town preferred. A. G. P., Messrs. Holman, Ham & Co., Chemists, Exeter.

AS Assistant or Manage a Branch. Age 25. Qualified. Town and country experience. Disengaged 27 January. H. Whiffin, 17, Market St., Torquay.

AS Assistant or Branch Manager. Married. No family. 18 years' experience. Height 5ft. 10in. B. T., 33, Cambridge Ter., Bridge Rd., Southampton.

ENGAGEMENTS WANTED.

LOCUM TENENS. At once. Minor qualification. Excellent references. Age 27. Height 6ft. French Pharmacy and language. CYCLOPS, Manor House, Stanion, Thrapstone.

BY a young man, age 19, in a Laboratory. 2 years' experience in good house. References good. Wages moderate. ARTHUR SMITH, 20, Nursling St., Leicester.

AS JUNIOR, in London, where two or more are kept. Age 22. Height 5ft. 10½in. 6 years' experience. Moderate salary. S. EMMS, 30, Richmond Pl., Brighton.

AS JUNIOR. 6 years' experience. Age 22. Out-door. Now disengaged. CETACEUM, 22, Southgate, Halifax.

AS ASSISTANT, in London. In or out-door. Age 23. Height 5ft. 10in. 8 years' London experience. Disengaged. C. BELL, 23, Queen's Rd., Bayswater, W.

AS JUNIOR, in good Dispensing business in London, with facilities for attending lectures. Good references. Tooth Extractor. Abstainer. In-doors preferred. Age 20. Height 5ft. 8½in. ARTHUR GRANT, Helston.

AS Junior ASSISTANT or Town TRAVELLER in Wholesale Drug or Oil and Colour Warehouse. Good reference. F. W., 1, Barnabas St., City Rd., Bristol.

AS Junior ASSISTANT, with time allowed for study. Accustomed to light Retail and Dispensing. G. D., 1, Walcot Buildings, Bath.

AS JUNIOR. Wholesale or Retail, experienced in both. Town or country. Age 22. First-class references. M., Harvey & Reynolds, Chemists, Leeds.

AS ASSISTANT, in or near London. Accustomed to good class Retail and Dispensing. Age 22. A., 11, Gilbert St., Oxford St., W.

AS ASSISTANT. Disengaged. Steady and trustworthy. Seeks situation in light Retail and Dispensing business. In or near London preferred. Age 24. Height 5ft. 10in. Excellent references. J. B., 3, Prince of Wales' Cres., N.W.

AS ASSISTANT. Age 21. 5ft. 9in. Has had 6 years' experience in first-class Retail and Dispensing business. CHEMIST, 87, Branston Rd., Burton-on-Trent.

LOCUM TENENS.— Mr. W. B. WEST, Staines Rd., Hounslow. Over 30 years' experience, and 12 years' references; with a list of more than 50 former clients forwarded on application.

AS JUNIOR or IMPROVER (out-doors), in Dispensing business. Age 20. Height 5ft. 7in. 5 years' experience. J. G., Market Pl., Waltham Abbey.

WHERE time for study would be allowed in lieu of part salary. 8 years' experience. Good reference. London only. JOHN STURDY, James Thurgood's, Goudhurst, Kent.

AS MANAGER. Qualified. Long experience. Good references. Married. A.B., 143, Sandringham Rd., Dalston, E.

AS ASSISTANT, in London or suburbs. First-class references. Good pushing Counterman. Neat, accurate Dispenser. 13 years' experience. Age 27. Permanency desired. FALTA, 1, Sussex Pl., Bath.

ASSISTANTS WANTED.

A JUNIOR, for a light Retail and Dispensing business. Apply, stating age, terms, and reference, to C. WILLIAMS, Pharmaceutical Chemist, Pembroke Dock.

AN ASSISTANT, with the Minor qualification, not under 24 years of age, is required immediately in the suburbs of London. Good references indispensable. Apply, in the first place, with particulars, to T. W., care of Messrs. Hill & Son, Wholesale Druggists, Southwark St., S.E.

ASSISTANTS WANTED.

APPRENTICE.—A well educated youth as APPRENTICE. A comfortable home and every opportunity for learning the business. Premium moderate. Apply, MELLOR, Dispensing Chemist, St. Neots, Hunts.

A STEADY, reliable ASSISTANT. Out-door. Salary £8 per month. Personal application indispensable. Apply to T. S. BECKETT, Chemist and Druggist, 67, Victoria Dock Rd.

MIDDLE of January.—An ASSISTANT, 22 to 28 (Welsh), accustomed to Dispensing and good class Mixed country trade. Hours of business short. Please apply, with particulars, to DAVID W. JONES, Aberdare.

AN ASSISTANT, not under 22 years, for a good class Mixed country business in an agricultural district. Must be a neat Dispenser, steady, and obliging. State salary (in-doors) and all particulars. Enclose photo. (to be returned). L. F. FRESSON, Pharmaceutical Chemist, High St., Stevenage, Herts.

IMMEDIATELY.—An ASSISTANT. Must be well qualified, and references unexceptionable. Wesleyan preferred. Apply, C. W. DIXON, Chemist, Mansfield Rd., Nottingham.

ASSISTANT. Must be a competent Dispenser and accustomed to good class business. Apply, stating full particulars and enclosing carte, SAML. A. SMITH, 102, Parade, Leamington.

IMMEDIATELY.—A Junior ASSISTANT. Out-door. One accustomed to good Family and Dispensing business. Address, with carte (to be returned), stating age, height, and salary required, to J. TRINDER, 136, Market Pl., Cirencester.

PARIS. — Immediately.—An ASSISTANT, speaking French. A liberal salary will be given for corresponding advantages. The advertiser would be glad to meet with a gentleman seeking a permanency, and one who is thoroughly acquainted with his profession, of agreeable manners, and good Counterman. Four or five assistants are employed in this establishment. Address, stating age, height, references, if single preferred, and salary required, board out, CHEMICUS, Galignani Offices, 224, Rue Rivoli, Paris.

IMMEDIATELY.—A good JUNIOR, of gentlemanly address, steady habits and Christian principles, for a select seaside Dispensing business. Must be a quick and accurate Dispenser, and thoroughly trustworthy. Apply, with carte (to be returned), to F. R. BESSANT, 24, Station Rd., Westgate-on-Sea.

IMMEDIATE.—A quick, active young man (not married). Must be well recommended. Duties: to parcel all shop orders and see them properly despatched by porters. Apply, stating age, height, and salary required, and enclose carte de visite, WAND'S Drug Store, Haymarket, Leicester.

A JUNIOR ASSISTANT, about 21 years of age, accustomed to a good class Family and Dispensing business. Apply, stating full particulars of experience, salary required, &c., to PHARMACIST, care of Messrs. Hodgkinsons & Co., Upper Whitecross St., London.

SENIOR ASSISTANT. Good Dispenser. Accustomed to country trade. Apply, stating full particulars, to H. HYETT, late Tomlinson & Hayward, Bailgate, Lincoln.

MANAGER for a small country business. Good Prescriber and one with a knowledge of Dentistry preferred. Single, with undeniable references, not under 30. Apply, CHEMIST, High St., Brandon, Suffolk.

W. ADAMS, Dispensing Chemist, Exeter St., Plymouth, requires a Junior ASSISTANT, about 21. Only one kept. Churchman preferred. Applicants please state all particulars.

ASSISTANTS WANTED.

IMMEDIATELY.—An Assistant, about 24, in a good class business. T. H. Powell, 116, Denmark Hill, S.E.

BY the end of January.—A Junior Assistant, not under 22 years of age. One would be treated with to whom three hours daily for study would be a consideration. Address, with the usual particulars, stating salary required, R., care of Messrs. Baiss Bros., 4, Jewry St., Aldgate, E.C.

MANAGER for a Branch establishment, about 20 miles from London. Good class trade. Furnished apartments and gas provided. Salary and commission. Must have good references. Apply to Messrs. Taylor & Co., 38, Walbrook, E.C.

AN Assistant, from 22 to 25 years of age. Must be well up in Dispensing and first-class Retail. West End. Seveval assistants are kept. State full particulars, enclosing carte and salary required, to W., care of Messrs. Maw, Son & Thompson, 10 and 12, Aldersgate St.

DRUG and Grocery.—Assistant, accustomed to the two trades. Age about 22. In-doors. Apply, with full particulars as to experience and where obtained, to John C. Coles, Chemist, Grocer, and Wine and Spirit Merchant, Market Pl., Chippenham, Wilts.

ABOUT end of January.—An Assistant or Improver, age about 21. In-doors. Only one kept. Steady, obliging to customers and accustomed to ordinary Retail and Dispensing business. Apply, stating age, salary required, references, &c., to F. E. Fitt, Pharmaceutical Chemist, Barking (near London), Essex.

IMMEDIATELY.—An energetic trustworthy Manager for a Branch. Must be a Registered Chemist. Married preferred. Unfurnished house provided. State age, height, qualification, when disengaged, and salary required. Applications giving full particulars and enclosing photo. (to be returned) would be preferred. First address, Chemist, Messrs. Barclay & Sons, Farringdon St.

AT once.—A gentlemanly Assistant, about 24 years of age, who has been accustomed to first-class Retail and Dispensing. Apply, stating age, height, salary required, with carte, to J. Clarke, 88, George St., Croydon.

A STEADY Junior. One to be relied on in Dispensing, equal to plain book-keeping, and of active obliging manners at the counter. Of not less than 5 years' experience in the business. Address to E. Brown, 159, Woodhouse Lane, Leeds.

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MR. COOKE, Chymist, Church Row, Wandsworth, is in want of a young man of good address to make himself useful as an Assistant. Personal application preferred, but if in writing, state age, salary and experience.

A COMPETENT Junior, to take charge of a Surgeon's Retail. One who has some knowledge of Prescribing and minor surgery preferred. Apply personally to Dr. Berdoe, 513, Hackney Rd., London, before 11 or after 6.

AN Assistant for Bombay.—A really good Assistant, well up in Laboratory work, of gentlemanly address, and a good Salesman. Age 25 to 28 years. Apply by letter only to W. J. B., 16, Coleman St., E.C.

MR. SILLITOE, Red Hill, Surrey, requires a Junior Assistant. One who has been accustomed to a good country business preferred. Apply, stating age, qualifications, and other particulars.

ASSISTANTS WANTED.

APPRENTICE.—Messrs. J. P. Boyce & Son, Pharmaceutical Chemists, Chertsey, have a vacancy for an Apprentice.

APPRENTICE, in a light Retail and Dispensing business. South Coast watering-place. Very healthy locality. Comfortable home and time for study and recreation. Moderate premium. Address, Pharmacist, care of Dr. Langley, 50, Lincoln's Inn Fields, London, W.C.

IMMEDIATELY.—A Junior Assistant. Well up in counter work. Others kept. Send carte, if possible (to be returned). Apply, stating age, salary required (in-doors), and references, to Beall & Son, Chemists, Cambridge.

AT once, for China, qualified Assistant, who must have a thorough knowledge of accounts and first-class experience. Apply, giving full particulars of qualifications and previous engagements, &c., to Dakin Brothers, 2 & 3, Cree Church Lane, Leadenhall St., E.C.

HICKS & CO., Wholesale and Retail Druggists, Cardiff, have a vacancy for a Junior Assistant capable of undertaking office work. Apply, stating references, age, &c., and enclosing carte.

A COMPETENT Assistant for a Dispensing and general country business. Out-door. Apply, stating usual particulars, to W. H. Stanway, Chemist and Dentist, Kington, Herefordshire.

AN Assistant, age 25, in-door, for a good Dispensing and general business. Apply to Thomas Fore, Chemist, Birkenhead.

AN Assistant, about 21, in-doors, to travel two days a week. Apply, stating age, salary, height, with references and carte, to Edward Vinson, Middle Row, Maidstone, Kent.

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LONDON, W.—Nice select Retail and Dispensing Business. Doing £40 per month under management. Can be greatly increased. Price £300. Apply, Beta, care of Hodgkinsons, Stead & Treacher, 198, Upper Whitecross St., E.C.

MESSRS. HINE GILBERT have for disposal :— S.W. Select Retail and Dispensing. Low rent. Price £400. Another. Handsome corner. Returns £600. Fair offer wanted. Another. Returns over £3000. Price about £2500. N. Old established. Returns £700. Price about £450. Essex. Village trade of about £10 weekly. Trial given. First reasonable offer taken. Apply, 17, Hart St., Bloomsbury Sq.

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ADVERTISER wishes to meet with a gentleman who would be willing to invest £400 to £600 in a Wholesale Drysaltery, Oil and Colour TRADE. He would be required to undertake the travelling and general survey of the business. All letters treated with confidence. Apply, A. B. C., care of Harker, Stagg & Moss, Pountney Lane, London, E.C.

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A GENTLEMAN is desirous of purchasing a light Retail and Dispensing BUSINESS. London or suburbs preferred, but would have no objection to a good country trade. Returns from £900 to £1500. Address, with full particulars, CHEMICUS, 186, Tulse Hill, S.W.

IMMEDIATELY.—A genuine BUSINESS, in a respectable neighbourhood. Suburbs of London preferred, but not essential. Requiring the investment of about £500. Address full particulars in confidence to CHEMIST, 74, Tottenham Court Rd., W.C.

A GOOD Dispensing and light Retail BUSINESS (full prices), requiring the investment of from £1200 to £1800. Convenient house and good locality. Particulars to CHEMIST, 2, Westow Hill Ter., Upper Norwood, London, S.E.

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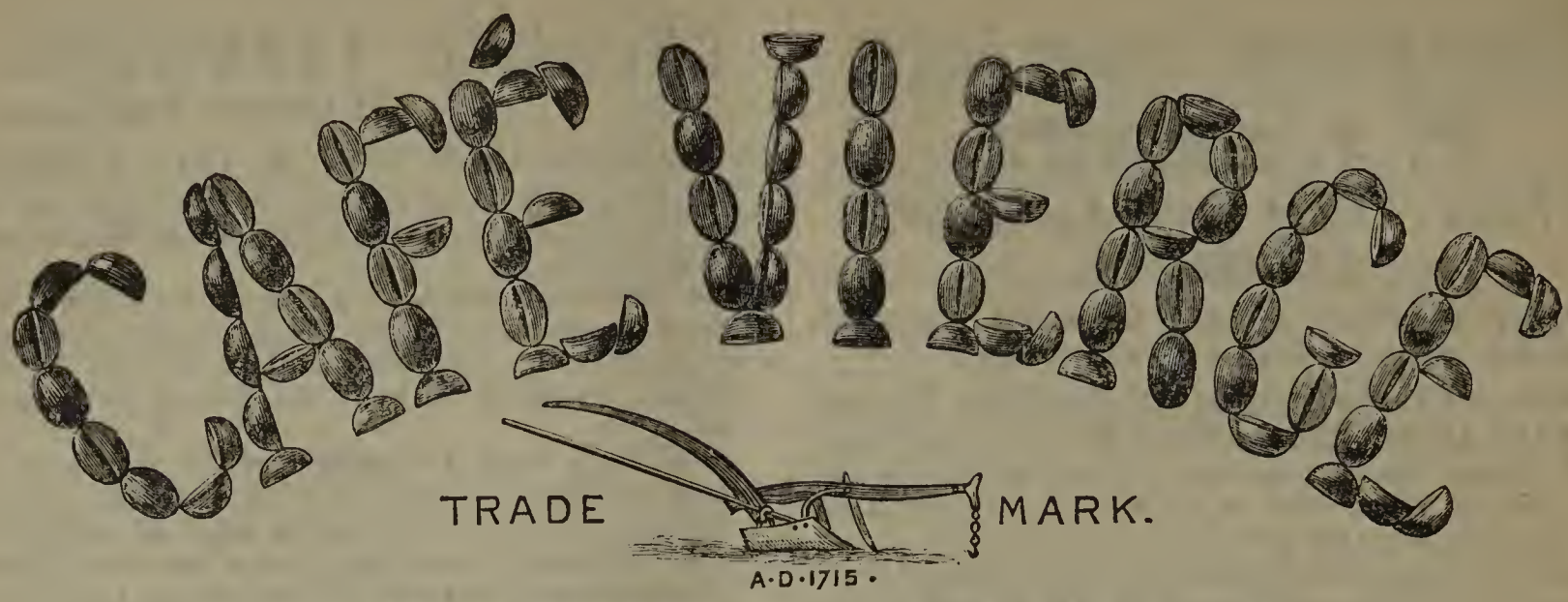
India Office, 1st January, 1884.



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The
Pharmaceutical Journal
AND
Transactions.

THIRD SERIES, No. 708.] SATURDAY, JANUARY 19, 1884. [PRICE FOURPENCE

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The next EVENING MEETING will be held on Wednesday, February 6th.

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With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on February 6th should be forwarded to the Secretary not later than Wednesday, the 30th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

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BROKERS' LIABILITIES. The same number contains an independent report of the important case of Domeier *v.* Hale.

MINCING LANE MARKET REPORT. Full information respecting the trade of the month and of the past year.

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Other articles, reports, editorial notes, correspondence, &c.

N.B.—Chemists subscribing from the January number of this year will receive the Diary for 1885, which will be published towards the end of this year, but they can obtain a copy of the Diary for 1884 by payment of 2/6 beyond the 10/- for subscription. For the Diary alone the price is 3/6.

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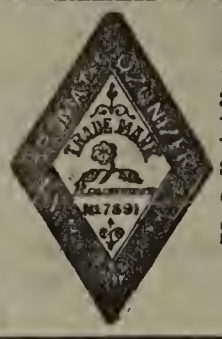

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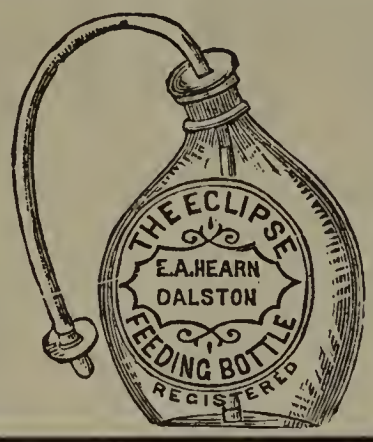

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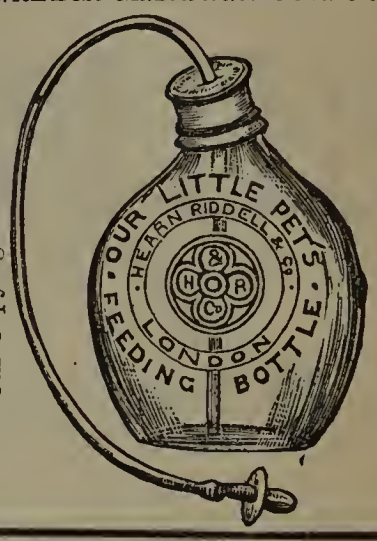

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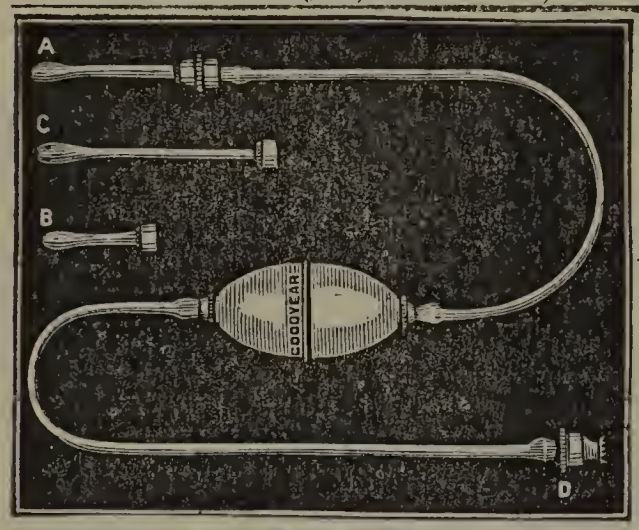

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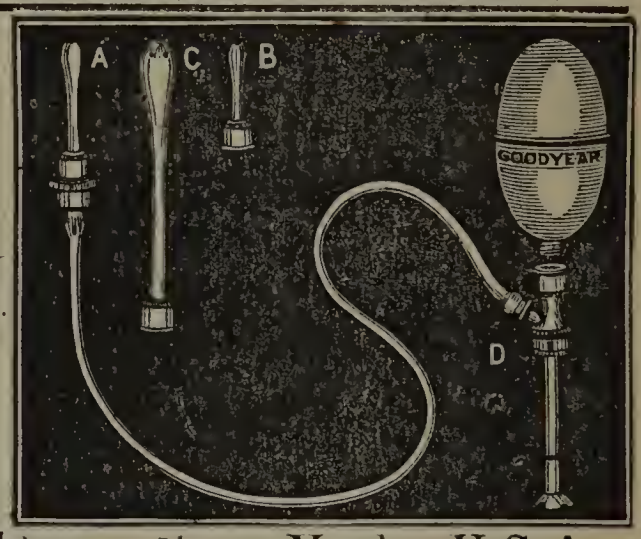

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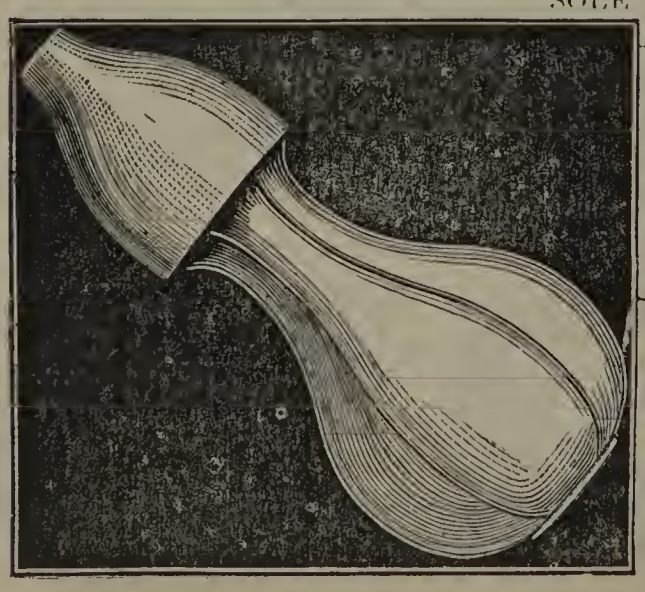

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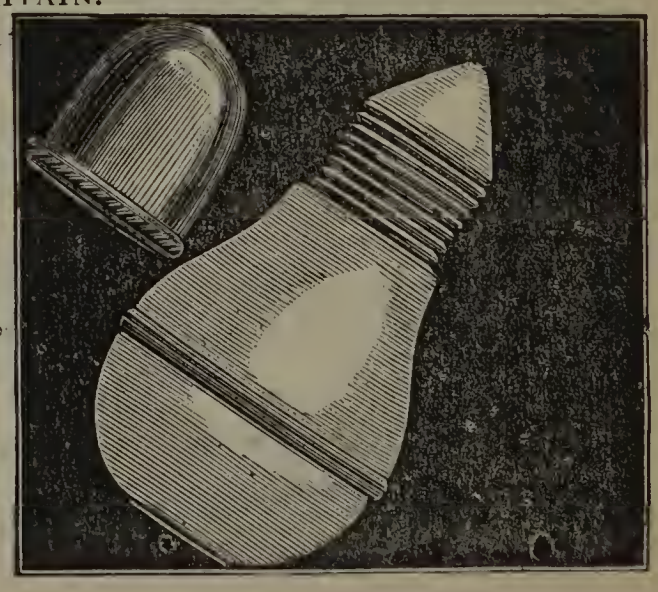

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See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

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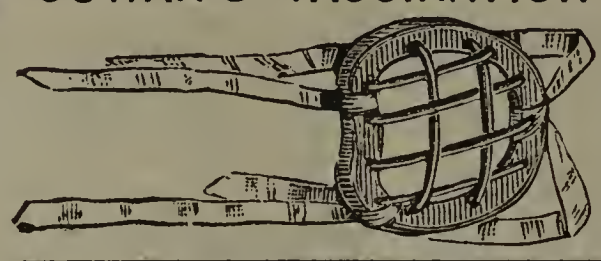

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LABORATORY NOTES.

BY W. H. SYMONS, F.R.M.S., F.C.S.,
Pharmaceutical Chemist.

Professor Attfield, in his famous Presidential Address to the British Pharmaceutical Conference, describes "the pharmacist proper" as "not only a distributor but a manufacturer or compounder of most pharmaceutical preparations he distributes; the man who can warrant the purity and efficiency of every drug he distributes, either because he has tested it, or because he has made it himself from materials which his professional knowledge tells him to be trustworthy." A glance at the *Pharmaceutical Journal* or the 'Year-Book of Pharmacy' shows that there are such pharmacists and that they give an immense amount of time to the investigation of drugs and chemicals. But, as a rule, it would seem that only the results of very exhaustive researches are published and the little every-day experiences of the laboratory remain hidden in the note-book; whereas, if published, they might be of material assistance to fellow workers and tend to raise the general standard of purity of the articles examined.

In the hope that others may be induced to publish more valuable work, I have selected the following from memoranda concerning the analyses of over two hundred and fifty drugs and chemicals purchased in the usual course of business and examined in my laboratory during the past year.

The processes by which my results were arrived at were, except when otherwise mentioned, the usual recognized methods; but in some few instances processes have been adopted and described simpler, perhaps, than those used for similar purposes in more important chemical investigations, yet sufficiently accurate for purposes of comparison. Care in every case has been taken to avoid giving any result which might be doubtful.

An alphabetical arrangement has been followed as the most generally suitable.

Acidum Hydrocyanicum Dilutum.—Sample No. 1 contained when purchased 1·42 per cent. HCy. Sample No. 2, 1·46 per cent.; after being stored four months in small blue bottles, stopper downwards, in shop cupboard, 1·36 per cent. Both samples contained a notable amount of chlorides.

Acidum Sulphurosum.—When purchased contained 6·72 per cent. SO_2; after being kept in an inverted stoppered bottle and not opened for four months, it contained 5·72 per cent. SO_2. The Pharmacopœia demands 9·2 per cent., but it is well known that practically such a solution cannot be obtained, that 7 per cent. is a good commercial specimen, and that 5 per cent. would be a much better standard.

Acidum Tartaricum.—Three commercial samples were examined; all of them were affected by sulphuretted hydrogen. An attempt was made to estimate the amount of metals present by colorimetric tests, comparing solutions of known quantities of the acids with a standard solution of lead and pure acid, by means of solution of sulphuretted hydrogen. 0·003, 0·004 and 0·010 per cent. were the results arrived at; but the presence of metals other than lead somewhat interferes with the accuracy of the method.

Alumen.—The commercial article is invariably potash alum, but "alumen, B.P.," is still obtainable when specially ordered.

Amylum.—Obtained from three sources. One firm invariably supplies wheat starch; a second for "amylum" sends out maize starch, but for "amylum, B.P.," wheat starch; a third firm sent what on inquiry they said was rice starch, but which I found to be maize starch. Maize starch is quite equal to that of wheat for general pharmaceutical and toilet purposes, and is less often musty.

Bismuthi Subcarbonas.—Five specimens examined; all contained large traces of nitrate.

"*Calamine.*"—Five samples examined. No. 1 contained 90·5 per cent. barium sulphate. No 2, 3, and 4 were apparently similar to No. 1; being unacted upon, to any considerable extent, by acids, they were not further examined. No. 5 treated with hydrochloric acid dissolved with much effervescence, leaving only 2 per cent. insoluble. The acid liquid with ammonia yielded a copious precipitate, almost entirely soluble in excess. Another portion dried at 105° C., lost 0·28 per cent. moisture. At a full red heat it lost 19·46 per cent.

Calcii Chloridum.—A sample of foreign manufacture, examined immediately on opening a sealed bottle, lost 22·4 per cent. at 250° C. Another sample, labelled "pure anhydrous chloride of calcium," lost under similar circumstances 9·94 per cent. The Pharmacopœia directs in the formula for "solution (saturated) of chloride of calcium" 4 ounces of the salt to 5 ounces of distilled water; unless recently dried chloride of calcium be used, a saturated solution will not be obtained. The same authority gives the formula of chloride of calcium dried at 400° F. as CaCl (old style). Fresenius in his 'Quantitative Chemical Analysis,' 6th edition, p. 95, says that when exposed "for several hours to a tolerably strong heat (about 200° C.)" (=392° F.) "the white and porous mass obtained . . . consists of CaCl+2Aq." Roscoe and Schorlemmer also give it as $CaCl_2+2H_2O$.

"*Citrate of Magnesia.*"—A commercial sample gave after solution in water—

Free acid reckoned as tartaric . . .	1·3 per cent.
Magnesium sulphate ($MgSO_4 7H_2O$) .	12·0 per cent.
Sugar	18·0 per cent.

Creta Præparata.—This preparation, inelegant at all times, has this year been the subject of gross adulteration, a lot having been put on the market containing two-thirds its weight of plaster of paris. Had it been recommended only as "so much whiter" and "greatly superior to the common as a face powder" it would have been bad enough; but what are we to say when we are informed that "This preparation is a great improvement upon the common Prepared Chalk usually sold, and can be strongly recommended as much purer for medicinal purposes"?

Fortunately, a timely warning was given in your columns by Mr. F. Harris Alcock (vol. xiii., p. 1015), and I have reason to believe "this preparation" has not since been offered for sale by London houses. A box of this chalk (?) came into my hands a few days before Mr. Alcock's communication appeared. I found 67·25 per cent. total impurities, the bulk of this being calcium sulphate. It is only justice to the sellers to state that previous and subsequent lots from the same maker and with the same circular have not contained more than 7 per cent. impurities, and we may hope that the writer of the circular was not acquainted with the nature and extent of the adulteration.

Dispensing Measures.

One oz. conical glass measure, graduated both sides (verified).			Two drachm cylindrical measure (verified).			Half drachm cylindrical measure (verified).			Minim tube four trials on minim i. and minim v.	
Graduation.	Weight in grains.	Measure in minims.	Graduation.	Weight in grains.	Measure in minims.	Graduation.	Weight in grains.	Measure in minims.	Weight in grains.	Measure in minims.
℥j. . .	64·46	70·7	♏v. . .	5·53	6·0	♏v. . .	4·68	5·1	·885	0·97
℥ij. . .	123·17	135·0	♏x. . .	10·16	11·1	♏x. . .	9·28	10·2	1·030	1·13
℥iij. .	178·14	195·5	♏xx. .	18·36	20·0	♏xx. .	18·33	20·1	1·070	1·17
℥iv. .	233·52	256·2	♏xxx. .	30·00	33·0	♏xxx. .	27·82	30·5	1·035	1·14
℥v. . .	291·89	320·2	℥j, . .	58·26	64·0				4·655	5·11
℥vj. .	344·50	378·0	℥iss. . .	87·27	95·8				4·530	4·97
℥j. . .	467·25	512·7	℥ij. . .	112·48	123·5				4·665	5·12
									4·765	5·23

The bottom of the meniscus was taken as the correct reading. The one ounce and two drachm measures being measures of capacity, a sufficient quantity of liquid was delivered into them from a carefully balanced Schuster's alkalimeter, the loss of weight of which was then ascertained. The half-drachm measure was itself balanced and the weighings taken direct. In the case of the tube measure the minims were delivered into a suitable vessel and then weighed. It will be seen that the errors are all in one direction, and may have arisen through the graduator taking some other part of the meniscus. When once the errors are known they are easily guarded against.

Dispensing Weights.

Denomination. Grain.	Stamped.						Unstamped.			
	No. 1 Set.		No. 2 Set.		No. 3 Set.		No. 4 Set.		No. 5 Set.	
	Grain error.	Per cent. error.	Grain error.	Per cent. error.	Grain error.	Per cent. error.	Grain error.	Per cent. error.	Grain error.	Per cent. error.
½	+·04	8·0	+·120	24·	+·015	3·0	+·045	9·0	+·27	54·0
1	−·07	7·0	+·025	2·5	+·015	1·5	−·340	34·0	+·07	7·0
2	+·06	3·0	+·045	2.2	+·095	4·7	+·070	3·5	+·005	
3	−·02	0·7	+·050	1·7	+·035	1·2	+·545	18·2	+·09	3·0
4	+·11	2·8	+·085	2·1	+·080	2·0	+·120	3·0	+·10	2·5
5	+·02	0·4.	+·020	·4	+·035	·7	−·360	7·2	−·01	·2
6	+·02	0·3	+·035	·6	+·100	1·6	+·120	2·0	+·08	1·3

Denomination.	Stamped				Unstamped					
	No. 6 Set.		No. 7 Set.		No. 8 Set.		No. 9 Set.		No. 10 Set.	
	Grain error.	Per cent. error.	Grain error.	Per cent. error.	Grain error.	Per cent. error.	Grain error.	Per cent. error.	Grain error.	Per cent. error.
℈ss.	0·345	3·4	+·02	·2	+2·35	23·5	−0·135	1·3	−·030	0·3
℈j	0·020	0·1	+·06	·3	−2·79	14·0	−0·175	·9	+·705	3·5
ʒss.	0·160	0·5	+·09	·3	+3·71	12·4	+0·075	·25	+·015	
℈ij.	0·550	1·4	+·04	·1	+1·19	3·0	−0·045	·1	+·220	0·5
ʒj.	0·600	1·0	+·08	·1	+4·19	7·0	+0·015		−·017	0·3
ʒij.	0·340	0·3	−·06		−0·34	0·3	−0·050		+·050	0·4

The balance used in these investigations was one of Oertling's best (a model of good workmanship); the standard weights were also of ascertained accuracy.

Ferri Arsenias.—Two samples recently purchased yielded respectively 6·5 and 5·47 per cent. of ferrous salt. A small quantity was made in my laboratory according to the Pharmacopœia directions, without special precautions, it being exposed to air during washing and drying, for forty-eight hours, in order to imitate as nearly as possible the supposed conditions of manufacture on large scale; it contained 27·2 per cent. ferrous arseniate. The Pharmacopœia standard is 37·91 per cent.

Ferri Phosphas.—Old stock contained 26·25 per cent. ferrous salt, some recently purchased 37 per cent. The Pharmacopœia standard is 44·75 per cent.

Ferri et Quiniæ Citras.—Fifty grains dissolved in 1 ounce of water, rendered alkaline with ammonia, and shaken with two separate half ounces of ether, yielded 7 grains of alkaloid, which when burnt left no perceptible residue. The same sample by B.P. process gave 6·75 grains alkaloid. Another sample from a different maker, shaken with three lots of chloroform (instead of the ether), yielded 8·3 grains total alkaloid, 7·8 grains being soluble in ether.

Ferrum Redactum.—Old stock contained 32 per cent. of an oxide of iron, some newly purchased only 27·5 per cent. The Pharmacopœia allows as much as 50 per cent.

Hydrargyrum cum Cretâ.—Three new samples examined, all contained traces of mercuric oxide.

Liquorice.—Two samples examined, both yielded 34 per cent. of matter insoluble in water, which under the microscope appeared little else but starch, more or less disorganized.

Linseed.—Several samples examined, all very good as far as freedom from admixture with foreign seeds was concerned, but invariably infested with "acarus farinæ," an extremely pretty object when viewed under a microscope, but most unwelcome among linseed. To stop the depredation all the dust should be sifted off, and with it most of the eggs of the mite. The linseed can then be placed in a tin with a sponge saturated with chloroform, all life is soon destroyed, and a few minutes' exposure to air suffices to remove the odour of chloroform.

Liquor Lithiæ Effervescens.—One trade sample examined from syphon showed 11 grains lithiæ carbonas to the pint.

Liquor Magnesiæ Carbonatis. (Sold in syphons with excess of carbonic acid).—Yielded magnesia equal to 9·8 grains $(MgCO_3)_3$, MgO, $5H_2O$, in each ounce. The Pharmacopœia informs us that it should contain "about 13 grains of carbonate of magnesia in a fluid ounce." A few lines below, under characters and tests, we are told "a fluid ounce evaporated to dryness, yields a white solid residue, which after being calcined weighs no less than 5 grains" of magnesia; this is equal to 11·94 grains of the official carbonate. It is, I believe, however, pretty well understood that 8 grains per fluid ounce is a fair average yield of a product made strictly according to the Pharmacopœia. Kept under pressure in syphons it is rendered available of constant strength.

Liquor Potassæ.—Mr. Woodland, in a paper read before the British Pharmaceutical Conference in 1880, points out the numerous impurities contained in this preparation as found in commerce. The most objectionable of these are chlorides (present to the extent of 0·2 per cent., if we accept the average of ten samples examined by Mr. Woodland) and sulphates. These impurities are generally due to the carbonate of potash, which, as met with in commerce, is always more or less contaminated with them. Bicarbonate of potash on the other hand is one of the purest salts met with in pharmacy; I therefore propose the use of a proportional quantity of this salt in lieu of the carbonate of potash at present used. The formula would read thus:—

Bicarbonate of potassium . . . . 20 ounces,
(or more correctly, 8520 grains).
Slaked lime (washed) . . . . . 12 ounces.
Distilled water . . . . . 1 gallon.

Dissolve the bicarbonate of potash in one half the water, and heat the solution to the boiling point in a clean iron vessel, continue the ebullition for ten minutes, then add the lime previously mixed with the remainder of the water, etc.; or it may, where time is no object, be made by the cold process.

Liquor Potassæ Effervescens, B.P.—Various samples purchased at different times during the year. Half a pint of each sample was titrated with volumetric solution of oxalic acid, and the alkali indicated reckoned as $KHCO_3$.

Ten ounces of a sample of London water neutralized 180 grain measures of decinormal solution, equivalent to 0·9 grain $CaCO_3$, or 1·8 grains $KHCO_3$. All the samples examined had been made with hard water, but in the following statement of results no allowance has been made:—

Maker.	Sample.	Grains $KHCO_3$ per ½ pint.
A	1	8·3
A	2	7·5
A	3	8·1
B	1	5·2
B	2	5·0
B	3	5·0
B	4	14·4
C	1	10·5
C	2	10·8

As a rule observation with pocket spectroscope is sufficient to show when this preparation needs further examination, noticing the intensity and persistency of the spectrum. The pocket spectroscope is more convenient to use than a more complicated form of this apparatus. What the microscope is to drugs the spectroscope is to chemicals; each has its sphere of usefulness, and it would be difficult to say which is the more serviceable to the pharmacist.

Liquor Sodæ Chloratæ.—Old stock, 0·852 per cent. available chlorine. Freshly purchased, 1·13 per cent. Some bought a fortnight later from the same firm, evidently recently made, yielded 2·5 per cent., which is the official strength.

Liquor Sodæ Effervescens.—In the examination of these samples decinormal solution of oxalic acid was used. The chalk present in ordinary town water is equivalent to 1·5 grains $NaHCO_3$ per half pint. No allowance was made.

Maker.	Sample.	Grs. $NaHCO_3$ per ½ pint.
A	1	4·9
A	2	5·0
B	1, 2, 3 and 4 each	1·5
C	1	3·1
D	1 and 2	1·6
E	1	8·5
E	2	2·2
E	3	3·9
E	4	1·8
E	5	7·9

The last five samples were all purchased at one time; evidently the bicarbonate of sodium had been put in at hazard.

Soda water having been sold chiefly as a beverage, the absence of soda is certainly not "to the prejudice of the purchaser;" where an antacid is required, potash water should be recommended, as it generally contains alkali.

"*Peroxide of Hydrogen.* Ten volumes."—Four samples examined.

No. 1 contained chloride of barium and was not further tested. No. 2 had an acid reaction, and left on evaporation a notable quantity of sulphate of potassium. No. 3 contained 0·6 per cent. chloride of potassium. No. 4 left scarcely any residue. Five c.c. of Nos. 2, 3, 4, gave respectively, 30, 32 and 40·5 c.c. of gas when mixed in a suitable apparatus with 15 c.c. of volumetric solution of bichromate of potassium; hence they were 6, 6·4 and 8·1 volume preparations.

Potassium Carbonate.—Contained 1·5 per cent. chloride of potassium.

Potassium Nitrite.—Nitrous radicle estimated by means of solution of potassium permanganate.

Sample 1, old stock, deliquescent crystals, contained 86·2 per cent. KNO_2. Sample 2, recently purchased, in sticks slightly discoloured, 84·3 per cent. KNO_2.

Pumice Stone.—This, as is well known, is an impure silicate of aluminium not differing materially in composition from common fire-clay. As it is but slightly attacked, at normal temperature and pressure, by hydrochloric acid, losing but a small percentage of its weight and that chiefly iron, I generally submit the levigated powder, as purchased, to the action of this acid and content myself with that test. On treating a recently purchased sample in this way violent effervescence ensued. Further examination showed that the dried powder lost 12·3 per cent. on treating with dilute hydrochloric acid and that the loss was due chiefly to the solution of carbonate of calcium. The residue consisted of silica and aluminia in abundance, potash and lime in large traces, iron and manganese oxides in smaller traces. The carbonate of calcium was, I suppose, added to improve the colour.

Scammony.—A good article can generally be obtained for a fair price. A lot purchased as virgin scammony contained 83 per cent. resin of characteristic cheesy odour; a sample of a cheaper variety only 40 per cent. of resin, being heavily adulterated with starch.

Sodium Nitrite.—Sample 1, in flat light-brown coloured pieces contained only 6·6 per cent. $NaNO_2$. Sample 2, in small white crystals contained 96·5 per cent. $NaNO_2$.

Syrupus Ferri Phosphatis Co.—Three samples examined, all guaranteed to contain at least 2 grains of phosphate of iron and lime to each teaspoonful. One fluid drachm was mixed with a like quantity of stronger solution of ammonia, the precipitate thoroughly washed, dried and weighed. The wash water was collected and examined for calcium by oxalate of ammonium, iron by sulphide of ammonium, and chlorides by nitrate of silver in the presence of excess of nitric acid.

No. 1 gave 2·1 grains precipitate. The wash water showed traces of calcium, but no iron or chlorides.

No. 2 gave 2·2 grains precipitate. The wash water with the above mentioned tests did not show any traces of either calcium, iron or chlorides.

No. 3 (well known for its elegant appearance and pleasant taste) gave 0·35 grain precipitate. The wash water showed very slight traces of calcium (dried and weighed 0·18 grain = ·15 grain $Ca_3 2PO_4$), and iron, also an abundance of chlorides. The reason it surpassed (?) the other samples is thus evident. It could be of very little value medicinally.

The above test is of course rather crude, but time did not permit of a more complete chemical analysis. As a ready means of distinguishing a good "chemical food" from a poor one, I would suggest mixing a sample of each with half its volume of the stronger solution of ammonia. A good specimen will yield a precipitate so copious as to render the whole almost solid; in a syrup containing only traces of phosphate the consistency is scarcely altered.

Zinci Oleas.—Forms a perfectly clear fluid at 81° C. 1·447 gram left on ignition 0·188 gram residue (wholly soluble without effervescence in hydrochloric acid), or 13 per cent. oxide of zinc. Theoretically oleate of zinc should yield 12·9 per cent. oxide of zinc.

In summarizing my results it is interesting to note that out of two hundred and fifty drugs and chemicals examined only one could be considered a case of serious adulteration, viz., creta præparata. The substitute for calamine has been in the market so long as to become recognized by some as calamine. Ferri arsenias, being seldom used, is generally old and oxidized, an improvement would doubtless be to keep it in small quantities in closed tubes freed from oxygen. As to chemical food, good keeping properties and pleasant taste are not the only qualities such an article should have to recommend it. In other cases the impurities were more or less accidental, but might be guarded against by pharmacists demanding analytical certificates with each lot of goods purchased, and not merely trusting to the payment of the best price as a sufficient security for obtaining the best article.

AMERICAN DRUGS.*

BY J. MOELLER,

Botanist and Microscopist of the Imperial Forest Institute, Mariabrunn, near Vienna.

(*Continued from page* 468.)

2. HERBA MICROMERIÆ DOUGLASII (YERBA BUENA).

The part of the plant growing above ground, without flowers. The leaves, oval-shaped, with short leaf-stalks, blunt-pointed and coarsely notched, with nervation running along the rim and with very few tertiary nerves, are given off opposite each other from a square-shaped stem. (Fig. 2.)

Fig 2.

On their upper surface they are nearly smooth, while on the under surface they are thickly dotted with small spots and are covered with hair similar to that on the stem. The largest leaves are 4 cm. long and 3 cm. in width, growing gradually narrower and pointed towards the top. In the axils of the leaf are usually found only thin flower stems, 7 mm. in length; occasionally, however, the calyces are also attached. The latter are usually found to have been torn off in the drug. They are elliptical in circumference, 4 mm. in length, 5 mm. wide, five-toothed, profusely ribbed, with compact skin, hairy externally and internally bare; they envelop four nuts. The plant has a slightly aromatic odour, and a spicy, somewhat bitter taste.

Microscopical Character.—The upper skin of the leaves is furnished on either side with a tough cuticle and has two forms of trichoma. The hair is firm, conical, generally with two cells (Fig. 3), and is sessile on the somewhat prominent enlarged base of the mother cell. The hair gland is disk-shaped with a simple pedicle cell

* Reprinted from the *Therapeutic Gazette* and translated from the *Pharmaceutische Centralhalle*, 1882, Nos. 28, 31 and 33. We are indebted to the courtesy of Messrs. Parke, Davies and Co., of Detroit, for *clichés* of the original engravings illustrating this series of articles.

(Fig. 4) sessile on a tray-shaped cavity on the upper skin of the lower side of the leaf. The cuticle, of very delicate

Fig. 3.

texture, is removed by a vesicle formed beneath it by the accumulation of an intensely yellow gum.

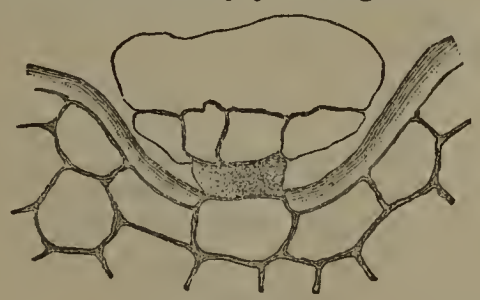

Fig. 4.

The plant from which the *yerbà reuma* is derived is the Labiate *Micromeriæ Douglasii*, Benth. (*Thymus Douglasii*, Bth.), and is indigenous in the north-western states of the American Union and in Columbia. It was recently introduced as a drug in California where it is employed as an anthelmintic, emmenagogue and febrifuge.

3. FOLIA CHEKAN.

The dried leaves with a few fragments of leaf-stalks.

The leaves are stiff, although not very brittle; the majority, therefore, when received in good condition are very delicately wrinkled, of a bright green colour, with a yellowish streak, short stem, somewhat curled at rim, and bald on each side. On the superior surface, which to the unassisted eye appears finely granulated, the central nerve only is visible in the majority of leaves; it is only in the larger leaves that secondary nerves may be traced to the circumference. On the lower surface the nerves on all leaves are prominent. The leaves are dotted with transparent points, though in the smaller leaves these points are visible only under the glass.

The leaves are elliptical to oval in shape (Fig 5),

Fig. 5.

pointed at the top and narrowed at the base; they vary in size (from 1 to 4 cm. in length) although the proportion between the length and breadth is constant (1 : 2·5) The leaves are quite odourless; on being rubbed between the fingers they, however, emit an agreeable aromatic odour. Their taste is at first purely aromatic, but is afterwards strongly bitter.

Microscopic Characteristics.—The cuticle is particularly developed on the superior surface of the leaf; a double row of palisade cells constitutes scarcely a third of the thickness of the leaf; the mesophyll consists of irregularly branched cells in an ordinary loosely arranged parenchyma. Large crystal cells are occasionally found among the palisade cells, but seldom or never in the mesophyll. Globular oil cells (0·07 to 0·15 mm. in diameter) with yellowish contents, are disposed under the cuticle of both the upper and lower surfaces.

The plant (*Myrtus Chekan*) from which the chekan leaves are gathered, is an evergreen shrub about 2 m. high, found in the central province of Chili. It differs from *Myrtus communis*, L., chiefly in the fact that its leaves are shorter and broader. Its flowers, also, are composed of but four leaves, are hairy like the calycle leaves, and are rounder than those of the latter. The leaves somewhat resemble smaller buchu leaves, especially those of *Barosma crenulata*, Hook., but the edges of the latter are indentated and so are readily recognized.

The virtues of chekan leaves reside in the tannin and ethereal oil which they contain. Hutchinson has vainly sought to discover an alkaloid in them (*Pharm. Journ.* 1879, p. 653), He discovered tannin which would turn blue in the presence of iron salts, and an ethereal oil, volatile at the ordinary temperature, soluble in chloroform, ether, ethylic and amylic alcohol, insoluble in water, and burning with a bright, white flame.

This plant has long been used under the name of chekan, chequen or cheken, in Chili, where it is held to be powerful aromatic and astringent. The juice of its leaves and young wood, diluted with water has been especially recommended as a collyrium. Don reports remarkable cures of dysentery effected by the liquor in which its bark had been steeped.

Dr. Dessauer, of Valparaiso, has recently been making extensive clinical experiments with chekan leaves. He used an infusion (1 part leaves with 10 parts boiling water), or an extract (produced according to the method prescribed in the United States Pharmacopœia for extracts of cinchona bark), or a syrup (1 part leaves and 2 parts syrup), or finally by inhalation. The results which he has obtained in bronchitis, catarrh of the bladder, and other affections of the mucous membranes, have induced him to ascribe to these leaves tonic, expectorant, diuretic and antiseptic qualities. Linarix attributes these same properties to the oil of common myrtle.

(*To be continued.*)

SALT WORKING AT MIDDLESBOROUGH.*

Among the various works visited by the members of the Iron and Steel Institute during their recent meeting at Middlesborough, were those for raising and preparing salt, undertaken by Messrs. Bell Brothers, the whole process being explained by Mr. T. Hugh Bell.

Although salt has been obtained by evaporating sea-water on the north-east coast for centuries, and local names, such as Saltholme and Salt Beck, would appear to prove early knowledge of the presence of salt, the deposit was only discovered in 1862, when Mr. John Vaughan, of Bolckow and Vaughan, bored for water on the south bank of the Tees, for feeding his steam boilers, and struck the salt at a depth of 1200 feet. The firm subsequently endeavoured to work the deposit by means of a shaft, but soon abandoned it on account of the heavy cost. In 1874, Messrs. Bell Brothers sank a bore-hole on the north side of the river, and found the salt at a depth of 1127 feet, or 73 feet nearer the surface. This deposit exists in the palæozoic series overlying the coal measures, and is about 3000 feet lower, and considerably older,

* From the *Journal of the Society of Arts.*

geologically, than the Cheshire salt, which is found entirely in the triassic series of rocks. The theory of its formation is that the salt water, in isolated basins cut off from the sea or communicating with it by narrow entrances only, was gradually concentrated until it became saturated. The extent of the bed has not been ascertained; and all that is known at present is that it rises to the north, and dips to the south. The thickness, however, as proved by a second bore-hole put down by Messrs. Bell in 1881, is 65 feet, which warrants the estimate that salt is present under Middlesborough in the proportion of 200,000 tons to the acre, which is exactly equal to the annual consumption on the Tyne.

In Cheshire, the surface water trickles through the clay to the gypsum, and flows over the salt, which is thus converted into brine, and only requires being raised to the surface; but, in the Middlesborough deposit, the nature of the strata and the great depth preclude all chance of infiltration. It occurred, however, to Mr. Thomas Bell, that the salt might be raised by allowing fresh water to flow into the hole and become saturated with salt, and then pumping out the brine, without sinking a shaft. The suggestion was quite independent, although this method of working has long been adopted in the east of France. Accordingly, the bore-hole was put down successfully by the rotary diamond drill; and it so happened that a portion of the lowest core was left at the bottom of the hole, leaving an annular space, which has served to receive the lower end of the lining tube. This latter is perforated with holes where it passes through the salt; and the greater portion of its weight is carried by a ring resting on the surface. An inner tube, perforated for a short distance at the bottom, is supported partly by a plate at the bottom and partly by girders at the top. There is an annular space between the two tubes, into which fresh water is allowed to flow. This water makes its way out through the holes in the outer tube, becomes saturated with salt, and rises in the inner tube, but only to such a level that the two columns bear the proportion of ten to twelve, that being the relation of the specific gravities of brine and water. The pump is, however, placed below this level, so as to avoid the necessity for suction. The pump, worked by an engine at the rate of fourteen strokes a minute, lifts from 8 to 9 gallons of brine at each stroke. When the cavity in the salt bed at the bottom of the hole has attained a certain size, the following is supposed by Mr. T. Hugh Bell to be what takes place. A molecule of water, descending the annular space between the two tubes, reaches the upper cavity in the salt, and there finds saturated brine. It, therefore, no longer continues its downward course, but floats on the surface of the heavier fluid, having no tendency to sink until it becomes saturated by coming into contact with the undissolved rock salt. The cavity at the bottom is, therefore, filled with a solution of salt, saturated, or nearly so, with fresh water flowing along its surface, and which gradually becomes saturated in turn. The pump draws the saturated solution from the bottom of the hole, and makes room for fresh water on the surface, so that there is a tendency for the hole to become enlarged at the bottom, and assume the form of a very flat inverted funnel.

The brine is pumped into a reservoir containing 500,000 gallons, and, roughly, between 500 and 600 tons of salt, the salometer standing at about 23°. Thence it flows into twelve shallow evaporating pans, nine of which are heated with coal, and three by the waste gases of the blast-furnaces adjoining, the temperature of the brine being kept at 170°. The salt crystallizes in regular cubes, which float on the surface; and on each cube is formed others, until the whole mass becomes too heavy to float, and sinks to the bottom. Some difficulty was experienced in a thin pellicle forming on the surface, which prevented the crystals from falling, and also arrested evaporation. This was found, on investigation, to be due to gelatinous vegetable matter, which was present in the surface water used; but upon water from the Darlington Waterworks being substituted, the difficulty ceased. Salt is taken out every other day upon platforms, called "hurdles," between the pans, and conveyed in barrows to railway waggons. A scale of sulphate of lime forms on the bottom of the pan, which requires removing at intervals, and also necessitates the laying off and thorough cleaning of the pan every three or four weeks. The twelve pans produce 360 tons a-week of coarse salt, suitable for curing purposes and for chemical works, table salt requiring to be crystallized at a much higher temperature.

COLOURING AMBER.*

For colouring amber it is necessary to find a liquid in which the amber can be heated, and this liquid must fulfil, says Professor Ed. Hanausek, the following conditions:—Its boiling point must lie above 150° C., and it is better if it boils above 200°. The amber must not be attacked by the hot liquid, nor must its physical characters be changed. The liquid must be able to dissolve dyes and not decompose them, or at least not rapidly. It should also be mentioned that the dyestuffs employed must not decompose at 150° or 200° C. Many of the fatty or essential oils, and also solid fats and hydrocarbons which melt below 150°, may fulfil these conditions. The attempt to impart different shades of colour to amber was made with linseed oil. The following pigments dissolve in it without being entirely decomposed at 200° C., viz., dragon's blood, alizarine, purpurine and indigo. Of the aniline colours—fuchsin, aniline violet, methyl green and alkali blue, all refuse to dissolve in pure linseed oil. In carrying out the experiment a weighed quantity was stirred into linseed oil, and the piece of amber to be coloured suspended therein, and slowly heated to 190° or 200° C. The liquid was then kept for some minutes at the temperature of 180° or 200°, after which the source of heat was removed and the hot liquid allowed to cool. After taking the amber out of the oil and cleansing it. it was found to be dyed.

A light or dark reddish-brown can be made with dragon's blood, bright yellow with alizarine, an orange yellow with purpurine, light or dark green, dark blue, and black from indigo. The proportions of indigo that must be taken to obtain the shades mentioned are given as follows:—For light green, $\frac{1}{4}$th of a part of indigo to 100 parts of oil; for dark green, $\frac{1}{2}$ a part to 100; for dark blue, 1 part of indigo to 100; and finally, for black, 4 or 5 parts of indigo to 100 of oil; on heating the oil, the indigo dissolves in it and imparts to it a very beautiful reddish-purple.

By frequently heating these mixtures to 200° C., both the indigo and the linseed oil suffer some change. The oil gets thicker and turns brown, and when heated it no longer assumes such a fine purple colour. A mixture that has undergone this change from heating, colours amber brownish; hence, when it is desired to obtain pure shades of green and blue, it is necessary to frequently change the dye baths or renew them. In dyeing black it is not necessary to suspend the amber in the liquid, for it is coloured more quickly when it lies on the bottom in contact with any undissolved indigo.

If finely pulverized asphalt is put in linseed oil, and the oil heated until it almost boils, a portion of the asphalt will dissolve, forming a brownish liquid and have a distinct green fluorescence. Amber that has been heated in this liquid for a long time to 200° C. acquires a brownish colour and has a slight greenish fluorescence. This fluorescence is, however, much more distinct and striking if the amber is subsequently heated in a mixture of 1 part of indigo in 1000 of oil. All hydrocarbons which are fluorescent themselves can impart this quality to amber.

* From *Neueste Erfind. und Erfahr.* Reprinted from the *Oil, Paint and Drug Reporter.*

The Pharmaceutical Journal.

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THE PHARMACIST AS A DISTRIBUTOR OF MEDICINES.

OUR pages this week contain two communications neither of them pretending to great importance in respect to the matter they contain, but both of them worthy of notice because of the spirit by which they are pervaded. They well illustrate the essential difference that should exist between the mode in which the pharmacist carries on his business and that adopted by the grocer or drysalter, and upon which he bases a claim for a higher social status and a more liberal remuneration for his services that are more or less accorded to him by all the thinking portion of the community. It is true it has been urged, and with some force, that in presence of the keen competition by which the pharmacist is beset on every side, he would do well to remember that he is a tradesman and a skilled operator, but not a professional man, and to be satisfied to do the trade part of his calling upon thorough trade principles. This is very good advice as far as it goes, and probably in proportion to the neglect of it by the pharmacist he will be a sufferer. But even the conducting of business on thorough trade principles requires that a man should have a clear perception of the true value of what he sells, and not be betrayed through the confusion evolved in the struggle into vending his wares at less than cost price because a neighbour is selling articles that resemble them at a low figure. And it will only be in so far as the qualified pharmacist remembers that he has something to sell that the unqualified grocer or huckster or keeper of a store has not, and demonstrates this capability to the public by the maaner in which he conducts his business, that his experience *quâ* pharmacist will afford him satisfaction or answer to his expectations.

We are perfectly well aware that there is a large amount of business carried on in connection with the drug trade which it would be mere affectation to look upon in this light; business for the transaction of which the most important qualifications are to be able to buy well and to sell well, and the getting or retaining of which is often dependent upon a turn of a trifle in the prices. We have no intention of speaking slightingly of this class of business,—which, indeed, is an important source of income to many chemists and druggists,—but we do not consider that this should come into question as ruling the conditions under which the pharmaceutical part of the business is conducted. We are prepared, however to give the word "pharmacy" a very wide meaning, covering whatever pertains to the dispensing and retailing of medicines, and say in respect to it that the pharmacist cannot in justice to himself or his *confrères* afford to lose sight of the fact that for this service to the public he possesses qualifications that have cost him time, labour and money, which he should therefore neither leave unexercised nor undervalue. Of course, the extent to which the public is likely to recognize or be willing to pay for these qualifications will vary with the locality and other conditions; but care should be taken that if such recognition be not a constant quantity, it shall at least be a reality, since nothing will be so likely to lead to the value of the qualifications being ignored by the public as the light estimation of them by the pharmacist himself.

Mr. SYMONS in his "Laboratory Notes" well illustrates one of the peculiar services that the qualified pharmacist is capable of rendering and should conscientiously render to the public. Professor ATTFIELD was not one whit too stringent in his definition of the "pharmacist proper," as quoted by Mr. SYMONS, as "the man who can warrant the purity and efficiency of every drug he distributes, either because he has tested it or because he has made it himself from materials which his professional knowledge tells him to be trustworthy." So, in his "analyses of over two hundred and fifty drugs and chemicals purchased in the usual course of business" during the past year, Mr. SYMONS has not only been protecting himself, but he has been rendering a service to his customers for which he should, and no doubt will, eventually find remuneration in cash and reputation. A well-known pharmacist, in an able paper that contained many unpalatable truths smartly put and provoked much discussion some two years since, alleged that "the trouble and responsibility of selling an ounce of rhubarb or Gregory's mixture is just about equal to that of selling a quarter of a pound of tea or coffee;" and that "if the educated pharmacist, accustomed to the use of the microscope, can see what appears to him a great responsibility in the sale of such drugs, it is more than the public or the Government can do." With respect to the former opinion we think it is sufficiently disproved by Mr. SYMONS'S paper, and if the latter opinion be accepted as correct it is difficult to understand the grounds upon which the enactment of the existing Pharmacy Acts was sought or effected or why it should now be desirable to seek for the establishment of a curriculum. But we entirely demur to the truth of these statements. We believe, on the contrary, that the feeling is rapidly gaining ground amongst the public, and the Government which is

a reflex of it, that the distribution of drugs and medicines should, as far as possible, be in the hands of qualified pharmacists, capable of estimating and guaranteeing their identity and quality, and that very few persons, other things being equal, would think it immaterial whether their supplies of medicines were drawn from the chemist and druggist or the grocer. It seems to follow that the future of pharmacy in this country will depend very much upon the extent to which those who practise it succeed, by the judicious and continuous exercise of their special qualifications, in maintaining and intensifying this preference of the public for their services.

The question that is mooted by Mr. C. B. Allen, in his letter, is another that requires careful consideration at the present juncture. The sale of patent medicines, though once a profitable adjunct to was never looked upon as an ideal form of the practice of pharmacy. There are, indeed, a few among our ranks who would wash their hands entirely of the unclean thing; there are, however, more who look regretfully, if not resentfully, towards the portion of the trade that has in the course of the last few years drifted into the hands of grocers, oilmen, linen drapers, *et hoc genus omne*. As long as the pharmacist sells these articles as so many sealed packets, concerning the contents of which he, sometimes ostentatiously, professes to know nothing, he can hardly expect the public to acquiesce in paying a higher price for them to him than to his competitor. But should the exclusive right of dealing in patent medicines containing poisons be conceded to the registered chemist and druggist, as seems not impossible, the position will be very much altered. Then, at least, if not now, if he persists in retailing particular medicines which have supplied occasions for a coroner's jury, without a caution as to the uncertain nature of the compound, he will be incurring a very grave responsibility, and may become involved in unpleasant consequences.

The *St. James's Gazette* reports that at an inquest held in Eastbourne on Monday last, Mr. H. R. Brown, who had been summoned as a juror, but objected to serve on the ground that he was a pharmaceutical chemist in full practice, was told by the coroner that he could not claim exemption on such ground as that. After some discussion Mr. Brown was allowed to leave; but the coroner requested the police to summon him again for the next inquest, intimating that if he then declined to serve he would be fined forty shillings. According to the second section of the Juries Act, 1862, "All registered pharmaceutical chemists . . . . actually practising . . . . shall be and are hereby absolutely freed and exempted from being returned and from serving upon any juries or inquests whatsoever," and provided that care has been taken by the objector at the proper time to ensure that his name has not been improperly inserted on the register, "such ground," when brought within the cognizance of the coroner, would, presumably, be deemed sufficient for claiming and obtaining exemption.

* * *

The Eighteenth Chemists' Ball was held at Willis's Rooms on Wednesday last and was attended by nearly two hundred and fifty persons. The chair at the supper was taken by the President of the Pharmaceutical Society, who, in proposing the toast of "Success to the Chemists' Ball," referred to the circumstance that before the institution of the Ball eighteen years ago there had been no general social gathering of pharmacists at which ladies were present, and said that he considered these meetings did much for the *esprit de corps* by promoting good fellowship and mutual respect. It is needless to say that the music was excellent, as it was performed by Mr. Dan Godfrey's band, under the direction of that gentleman. The general arrangements were admirably carried out under the superintendence of Mr. F. W. Warrick, the Honorary Secretary.

* * *

On another page, Mr. Robert Cross, whose name is well known to readers of this Journal in connection with his botanical explorations in South America, gives an account of an interesting experiment made by him in respect to the influence of the electric light upon the development of chlorophyll in plants. We do not think, however, that the results altogether warrant the unqualified tone of his assertion that the electric light will not be found to influence in the remotest degree the development of vegetation. Certainly Mr. Cross's negative results cannot be accepted as sufficient to disprove the positive results obtained by the late Sir William Siemens in 1880, since the experiments do not appear to have been made under similar conditions, the electric light having been supplementary to sunlight in the one case, while in the other an interval of darkness took the place of the sunlight period. Moreover, exposure of the plants to the full glare of the electric light in an enclosed space was expressly stated by Sir William Siemens, in the paper read by him before the British Association in 1881, to influence them prejudicially and not beneficially.

* * *

The Legislature of Massachusetts having passed a law for the prevention of the adulteration of food and drugs, the State Board of Health has lost no time before trying to put it into force against the wholesale druggists. One charge was for selling tincture of opium that contained only 0·81 per cent., of morphine, whereas the morphia strength according to the new Pharmacopœia should be 1·2 per cent., and according to that of 1870 0·9 per cent. This case was not tried on its merits, it having been dismissed upon the curious quibble that there was no evidence that the person who sold the drug was an "authorized salesman," though it does not appear whether by this the Court meant that he had not been authorized to act as a salesman by a College of Pharmacy or that he had not been authorized to make the particular sale by his employer.

* * *

Another charge was for selling "citrate of iron and quinine" which did not meet the requirement of the U.S.P. in containing 12 per cent. of quinine. For the defence it was pleaded that the article was not sold as the official preparation, — from which it

differed by being in green scales instead of red and being much more soluble,—but as a preparation made by the defendants for many years and marked "English style." On the other hand, the prosecutors urged that an article had been demanded in writing under a Pharmacopœia name and that none but the official article should have been supplied. The Court adopted this view and inflicted a slight fine, against which decision a notice of appeal was given.

* * *

The subject of the inconvenience arising from the large number of special preparations which are now prescribed in the United States was brought under the notice of the American Pharmaceutical Association at its last meeting and referred to a Committee. A suggestion has been made to meet the difficulty by adopting series of "unofficial formulæ," and requesting physicians to give them the preference in prescribing. The Committee appears to have decided to adopt this course, and invites co-operation in the compilation of formulæ for elixirs, proposing, eventually, to deal with fluid extracts, ointments containing petroleum products, wines, emulsions and pills.

* * *

According to the *Chemiker Zeitung* an article has been introduced into commerce, which on account of its low price, fine appearance and solubility has to a large extent been substituted for tartarated antimony in dyeing and printing operations. It proves to be an oxalate of antimony and potassium, which is said to be prepared by saturating a boiling solution of acid oxalate of potassium with freshly precipitated oxide of antimony, and filtering while at the boiling temperature, the salt being deposited as the liquid cools in fine crystals resembling those of the double tartrate. It would appear probable, however, that the same compound is sometimes used in a more questionable manner, since the *Moniteur de la Pharmacie* speaks of parcels of "tartar emetic" having been received by two Paris pharmaciens, containing oxalic acid. In a third sample the oxalic acid is said to have given place to phosphate of soda.

* * *

A Committee appointed at the Conference of Head Masters in 1882 to consider the subject of the inconvenience caused in many schools through the necessity of preparing pupils in the same term for various examinations in which different books are required has come to a decision that will very probably influence future university local and other similar examinations. In view of the fact that the examinations in languages, as at present conducted, often test little more than the knowledge of limited portions of set books, and after consulting a large number of teachers, the Committee recommends that in all public examinations a fair proportion of "unseen work" should be set; and that, whilst not excluding set books, the conditions of all public examinations in languages should be such as to admit the possibility of passing without set books. The desirability of this reform can hardly be disputed, since it would put an end to much unsound teaching which at present has for its object to "cram" the pupil in a certain book, rather than to teach him a language. An illustration of the result was met with not long ago, when one of the candidates in the "Preliminary" wrote out the English rendering of a passage in Cæsar which was not set. Even with considerable vocabulary help and comparative leniency in estimating results, an examination on a passage from an author not previously indicated would be far the more satisfactory test as to a general knowledge of a language.

* * *

The *British Medical Journal*, in an editorial review of the different opinions that have been expressed respecting kairin,—which, by the way, notwithstanding what has been published, it describes as oxychinoline-*methyl*-hydride,—sums up the present state of the question by saying:—"It must be admitted that the prospects of kairin are anything but promising. It has been tried in this country, but as yet has found little favour. It will probably have its day, and then die out, as many remedies of the same class have already done."

* * *

According to the *Times of India* the cinchona bark exported from Ceylon during the three months ending December 31 last, amounted to 1,448,845 pounds, consisting of 1,263,657 pounds of trunk bark and 185,188 pounds of branch bark. This quantity was 183,297 pounds in excess of the quantity exported during the same months in 1882. Nearly two-thirds of this bark (881,212 pounds) was sent to this country. Italy was the next best customer, 414,778 pounds having been shipped to Venice and Genoa. Other continental ports were to share 14,697 pounds between them, and American ports 6946 pounds.

* * *

Among the Bills introduced into Parliament during the coming session there will probably be one promoted by the Council of the Institute of Chemistry, and having for its principal object to effect the incorporation of that association, which is at present a company registered under the Limited Liability Act.

* * *

Our contemporary, *New Remedies*, which has attained a prominent position among the many pharmaceutical journals now published in the United States, has just undergone important modifications in name and style. Henceforth it is to be called the *American Druggist*, and the pages will be considerably increased in size. The latter alteration probably finds its explanation in the growing requirements for "bold advertisement," and there is evidence that there is no intention to neglect this—or, indeed, any other—part of the journal.

* * *

It has been decided by the Paris Municipal Council that a new street opened between the Rue du Faubourg Saint Antoine and the Rue de Montreuil, in the eleventh arondissement, shall bear the name of the veteran chemist Chevreul.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, January 24, at 8 p.m., when a "Note on Cadmium Iodide" will be read by Mr. F. W. Short, and a Report upon Analytical Chemistry will be made by Mr. C. Thompson on "The Qualitative and Quantitative Separation of Chlorides, Bromides and Iodides."

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, January 23, at 9 p.m., when a paper on "Unscientific Punishment" will be read by Mr. W. R. Dodd.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The sixth general meeting of the thirty-fifth session was held at the Royal Institution, on Thursday evening, December 20; the President, Mr. Edward Davies, in the chair.

The minutes of the previous meeting were read and confirmed, and the following donations to the Library and Museum were announced:—The *Pharmaceutical Journal* (two numbers), from the Society, and the 'Proceedings of the Liverpool Geological Society,' from the Society.

The Hon. Secretary read a letter from Mr. H. A. Tobias, offering for the acceptance of the Association a complete set of the products of distillation of shale, from the works of the Young's Oil Co., Limited, Addiewell.

A vote of thanks to Mr. Tobias was carried, and the Secretary instructed to acknowledge the gift with thanks.

Mr. A. C. Abraham presented to the Museum a specimen of American bamboo brier root (*Smilax sarsaparilla*). He explained that this plant had at one time been considered, in error, to be the source of the hemidesmus root of commerce, and that probably this arose from its use among the North American Indians having given it a name (Indian sarsaparilla) which was also applied to the hemidesmus. It had come into use recently in combination with other herbs, as a remedy for syphilis, under the auspices of Dr. McDade, and subsequently of Dr. Marion Sims.

Mr. Davies then read a note on—

Alleged Metallic Impurities in Tinned Meats.

BY EDWARD DAVIES, F.C.S., F.I.C.

My attention was recently called to a case of poisoning from eating tinned salmon, the doctor who had charge of the case having attributed the same to *nitrate of tin*. Of course the chemistry of the medical gentleman was, to say the least, peculiar. Nitrate of tin, either stannic or stannous, can only be formed by the action of nitric acid, either on tin or stannous hydrate for stannous nitrate, or on stannic hydrate for stannic nitrate. But there is no nitric acid in the flesh of salmon, and the formation of nitric acid from its nitrogen in the absence of oxygen is a chemical impossibility. Indeed, nitrates of tin are such unstable salts that they could not have endured the heat of preparing the tinned salmon even if they had been purposely added. Whether tin can be taken up by the oil in which the salmon is cooked seemed, however, a possible thing, forming a fatty salt of tin. I have therefore analysed the oil from a tin of preserved salmon, using the cheapest kind. Three hundred grains gave ·03 grain of residue on igniting the precipitated sulphides, of which a part was lead and a trace of tin. This amount is quite insufficient to cause any effect at all. Whether tin in such a form is poisonous is not known. The only salts of tin which have been known to possess poisonous properties are the stannous and stannic chloride. Stannic chloride, as usually prepared, contains free acid, and its strongly irritant effects may be thus partly accounted for, but these salts are not present in tinned meats. Tin in the metallic form is not at all poisonous, and tinned vessels have been in such constant use for cooking purposes that some cases must have been met with, if they could impart deleterious properties to the food. The lead which is almost always present in the tin used for tinning may be supposed to be the active agent. I have analysed tinned beef for this metal and found on the whole of the outside of the meat in a 4-lb. tin ·07 of a grain. The interior of the meat was quite free from this metal.

Lead poisoning from small doses does not cause sudden symptoms. Paralysis is the usual result and not symptoms of irritant poisoning. The amount above stated is quite insufficient to produce any visible effect and the removal of the outside would remove any that might be present.

I also analysed a tin of tomatoes which had apparently suffered partial decomposition. Two ounces gave ·10 of residue when the sulphides were ignited. This was principally tin with a minute amount of lead. The tomatoes were, of course, acid, and I think acid substances should not be preserved in tinned vessels, but even this quantity is so small that I should hesitate to assume that it could be injurious. The bad effects which have in a few cases resulted from the use of tinned meats are, in my opinion, due to decomposition of the meat, owing to imperfect closing or faults in preparation.

The results of my examination are that lead should be carefully excluded in the preparation of the tin plate, and that acid liquids should not be kept in tinned vessels, but that no cases are known in which any injurious effects have been proved to have resulted from metallic impurities in tinned meats.

Mr. Conroy moved a vote of thanks to Mr. Davies, stating that the subject was one of much general interest and importance to the public, and that his own experiments quite confirmed the results arrived at by Mr. Davies.

Mr. A. H. Samuel said that the trade in these tinned provisions had assumed enormous proportions in recent years, and it was very satisfactory to learn on such reliable evidence that there was no foundation for the supposed poisonous effects produced by the metallic vessels employed in packing these meats.

The President then called on Mr. Edward Bevan to read the following paper on—

The Chemistry of Cellulose.

BY EDWARD BEVAN.

It is only fair to state at the outset, and I owe an apology for the fact, that I have but little original matter to communicate, as the work of which this paper is a brief record has already been published in the *Journal of the Chemical Society*, and elsewhere, by my friend Mr. C. F. Cross and myself.

The title of the paper is perhaps somewhat misleading, as I want to speak not so much of cellulose itself as of that peculiar modification known as lignose, examples of which are to be found in wood, various kinds of bast fibres, and in nearly all the different parts of plant structures.

Two distinct views are held by different biologists and chemists as to the nature of lignose: one being that it consists of cellulose, surrounded by what is termed encrusting matter; the other that it is a distinct compound produced by a peculiar modification of the cellulose itself.

In the course of our investigations we have been forced to the conclusion that the latter view is the only one that accords with the observed facts, and it shall be my endeavour to put before you this evening a sketch of the chief results we have arrived at.

Jute was selected as the most convenient type of *lignification*, on account of its great uniformity in character and composition, and its being moreover extremely simple biologically, as compared with wood, etc. Its uniformity is moreover shown by the following numbers, giving the percentage composition, and yield of cellulose of two samples of the same piece. (α) Extreme upper ends; (β) extreme root ends—18 inches from ground.

	α	β
C	47·7 per cent.	47·1 per cent.
H	5·9 per cent.	5·7 per cent.
Cellulose	80·6 per cent.	80·0 per cent.

It was at a very early stage of our investigations that we were led to reject the hypothesis that a lignified tissue consisted of cellulose encrusted with so-called lignin, and to adopt in its stead that by which the tissue was regarded as a true chemical whole. The probability of the correctness of the latter hypothesis, and inferentially, of

the weakness of the former view is shown by a study of the action of various reagents on jute.

When jute is heated for some time with 10 per cent. sulphuric acid at about 95° C., a treatment that has but slight action upon cotton or even upon isolated jute cellulose, a large portion is dissolved away. If the residue be examined it will be found to yield practically the same percentage of cellulose as the original fibre, and moreover to possess the same percentage composition.

Now if the jute were simply a mixture of cellulose and encrusting matter, it may be presumed that the action of the sulphuric acid would have been selective, *i.e.*, either the cellulose or the encrusting matter would have been more completely attacked and thus the composition of the residue would have been altered.

Again, if jute be dissolved in ammonia-copper solution and the solution acidified, a precipitate is obtained possessing the properties of the original fibre; being in fact, merely an amorphous modification of it. If this be done fractionally, all the precipitates obtained are similar in character and composition.

The formation of homogeneous "nitro"-derivatives similiar to "nitro"-cellulose affords confirmatory evidence of a similar nature. If jute be treated with a nitrating mixture, such as is used in the manufacture of gun-cotton, explosive products are obtained, from which the original jute can be reproduced by means of certain reducing agents.

In order to obtain some idea of the nature of the body in such close chemical union with the cellulose we studied its behaviour towards various reagents.

The most important is chlorine.

If perfectly dry jute be exposed to dry chlorine gas no reaction occurs, even though the temperature be raised to 150° C. If, however, the jute be previously moistened and then exposed to chlorine a remarkable change takes place, the fibre, originally of a light grey colour, changing to a bright yellow. If this chlorinated jute be boiled in alcohol a large quantity of a bright yellow chlorine derivative passes into solution, from which it can be obtained as an amorphous precipitate on adding water. A large number of analyses of different preparations of this body point to the formula $C_{19}H_{18}Cl_4O_9$. The presence in the molecule of four atoms of chlorine and the resemblance in point of colour, smell and some of its reactions, to tetrachlorquinone seemed to suggest a relationship between the two bodies.

We were thus led at an early stage of the investigation to regard jute and similar substances as compounds of cellulose and a quinone or, as we then termed them, cellulo-quinones.

As our researches progressed we modified or rather extended this view.

If chlorinated jute be boiled in a dilute solution of caustic soda, it is entirely resolved, and a mass of pure cellulose remains. This forms the basis of a method for the rapid and accurate estimation of cellulose.

It is thus seen that by the action of moist chlorine jute is split up into cellulose on the one hand and a chlorinated derivative on the other. The aromatic nature of this body, suggested by its resemblance to tetrachlorquinone, is shown by the fact that on fusion with caustic potash it yields protocatechuic acid and phloroglucin. Though there can be but little doubt about the aromatic nature of the chlorinated derivative, it is somewhat difficult to regard the jute itself as aromatic, and for the following reasons. Dry chlorine has no action on jute, even when presented to it at as high a temperature as 150°; nor if jute be immersed in dry bromine does the least action take place. As we shall see later on, there is good reason to believe that the chlorinated derivative of jute has a very clear connection with the trihydric phenols; now, if the non-cellulose portion of jute were itself of that nature it is most probable that it would be acted upon by both dry chlorine and bromine, especially at elevated temperatures, in the same way that tannin, gallic acid and pyrogallic acid are acted upon.

This, however, is not so, and we were therefore led to regard jute as a compound of cellulose with, what we ventured to call, a potential aromatic body, which, by the action of moist chlorine, is resolved into an actual aromatic body.

The freshly prepared chlorinated jute, when immersed in a solution of sodium sulphite, develops a magnificent magenta colour, which has been of great value in the study of the constitution of this body and in the diagnosis of plant substances generally. By its means we have been able to demonstrate the very wide distribution in the plant world of substances allied to lignose. One rather striking example may be cited. If a thin section of a pear be exposed to the action of chlorine for some time and then treated with sodium sulphite solution, this coloration is produced in spots more or less regularly disposed in the flesh, showing very clearly the arrangement of the so-called stony concretions.

This magenta reaction is much more delicate, and, therefore, more reliable than the well-known one with aniline sulphate. It has been shown by Dr. Hugo Müller, that the latter reaction is not due to lignose itself, but to a body which always accompanies it, present in very small quantities. In confirmation of this we have found that if jute be boiled for a short time in a solution of sodium sulphite, this body is either removed or so altered that the fibre no longer gives the yellow coloration, but still possesses the power of giving the magenta reaction after chlorination. Therefore, lignose can be regarded quite apart from the aniline sulphate reaction. We have found, moreover, that the reaction is given in a more or less striking degree by many aldehydes, such for example as vanillin and cinnamic aldehyde. If the latter be shaken up with a strong solution of aniline sulphate it presently solidifies to a mass of deep yellow crystals. At the time we were investigating the chlorine derivative from jute, we were led to examine the liquors obtained in the process of manufacturing paper pulp from esparto by boiling it in caustic soda solution. If these liquors be acidified with HCl and the resulting precipitate of resin be treated with $KClO_3$ and HCl, a bright yellow chlorinated derivative is obtained, which after purification yields on combustion numbers pointing to the formula $C_{22}H_{23}Cl_4O_{10}$, and which in most of its properties resembles that obtained from jute.

These bodies are very slightly soluble in water but freely so in a solution of sodium sulphite, and if these solutions be examined they will be found to be somewhat astringent to the taste and to possess the property of precipitating solutions of gelatin. If, moreover, freshly chlorinated jute or sections of pear be treated with a solution of ferric chloride after previous treatment with sodium sulphite, a distinct green coloration may be observed.

All these observations point to a relation of the original substances to the tannins. The origiual substances, however, do not give any such reactions, or only the very faintest, and these facts together with a consideration of certain theories as to the origin of tannins, led us to speak of the non-cellulose portion of jute and similar bodies as "potential tannins." Moreover, if tannin itself be exposed to chlorine, it is rapidly converted into an orange-coloured derivative, which gives with sodium sulphite the magenta reaction previously described.

This view of the constitution of the jute substance, which, as we have seen, was an amplification of our former views, has itself been extended by subsequent investigation. The well-known relations existing between tannin, gallic acid and pyrogallol, led us to examine the action of chlorine on the latter body. This work had already been done by Stenhouse and Groves, who found that by treating pyrogallol dissolved in glacial acetic acid with a current of dry chlorine, certain

precautions being taken, it was converted into a mixture of bodies, the greater part of which were amorphous and very difficult to manipulate. They were able, however, to isolate a body in the form of brilliant crystals, to which they gave the name of mairogallol. We found that both mairogallol and the amorphous bodies that accompany it give the magenta reaction with great brilliancy. Although we have not yet been able to obtain mairogallol from jute, there can be no doubt that the similarity of the colour reaction, especially in view of the results of previous investigation, points to a close connection between the non-cellulose portion of jute and the trihydric phenols. Hitherto, we have been unable to obtain *any* crystalline bodies, excepting of course products of extreme resolution such as oxalic or protocatechuic acids, by any method of treatment; and this has of course added much to the difficulties of the work. Nor is it perhaps to be wondered at, that bodies which, forming as they do such an *essential* part of the plant structure, are of necessity amorphous, should yield only complicated amorphous derivatives.

The next most important point to consider is the action of sulphuric acid.

If jute be treated with a 10 per cent. acid, it first becomes disintegrated and then gradually dissolves. If the solution be distilled a product is obtained which is found to contain a large quantity of furfurol. In one case we obtained as much as 10 per cent. of the jute treated. The fact that so large quantity can be obtained by a somewhat simple treatment, indicates the aldehyde nature of the jute substance. In the light of this result we examined the stony concretions of pears which we had previously regarded as similar in constitution to jute. They very readily yielded a large quantity of furfurol. Erdmann, who had investigated these substances, came to the conclusion that they consisted of a body which he called glucodrupose, and stated that by the action of acids they yielded glucose and a substance call drupose; drupose itself being converted by the action of dilute nitric acid into cellulose.

In some modern text-books very symmetrical equations are given for the above decompositions, but it is clearly impossible to attach any importance to them, as they are constructed without any reference to such an important product as furfurol.

The aldehyde nature of lignified tissues has been of special interest to us in considering the theories involved in a process for the production of paper pulp from wood. The process consists in heating wood with a solution of bisulphite of magnesia at a pressure of about 90 lbs. to the square inch. We have had occasion to examine the liquors obtained as a bye-product by this process and have found that they consist chiefly of a solution of a complicated compound of the non-cellulose portion of the wood and magnesium sulphite. This compound is of very great stability and has, no doubt, an important bearing on both the theory and the practice of this process. The formation of such a compound is fully in accordance with the well-known property that aldehydes have, of forming compounds with the sulphites.

Of the exact nature of the change that cellulose undergoes during the process of lignification, but little is known with certainty, although a considerable amount of evidence exists of the conversion of cellulose and other carbohydrates into aromatic bodies and, therefore, incidentally of their conversion into lignose. For instance, it has been shown that by heating starch to a high temperature in presence of water pyrocatechin is formed. Under certain circumstances the "nitro"-celluloses, and even cellulose itself, may be converted into bodies of the pectic class, and metapectic acid has been proved to belong to the aromatic group, for it yields protocatechuic acid on fusion with potash. Perhaps the most convincing proof of the probability of such a change is shown by a study of the action of strong sulphuric acid on cellulose. By heating cellulose or dextrin, which is equivalent, for cellulose itself is first converted into dextrin, with strong H_2SO_4 at 70° C. it is converted into an insoluble black substance. The formation of this body has of course been frequently observed, but its nature does not appear to have been studied. Its *blackness* appears to have satisfied chemists that it was carbon, and the reaction has served for a very long time as a startling lecture experiment, the decomposition having been explained by a symmetrical equation showing how, by reason of the great affinity of strong H_2SO_4 for water, the carbohydrate was split up, carbon being left behind. As a matter of fact this black substance contains 60 to 70 per cent. of carbon only and that in combination with O and H. When acted upon by $KClO_3$ and HCl it is converted into a bright yellow chlorinated derivative perfectly soluble in alcohol and indistinguishable in appearance and general properties from that obtained from jute. The similarity in composition is also remarkable.

Dextrine.	Jute.
$C_{21}H_{18}Cl_4O_{10}$	$C_{19}H_{18}Cl_4O_9$.

When the original black substance is dried it forms a hard mass resembling coal. So close is the resemblance that we were led to examine coal from the stand-point of our previous work. We found that when treated in the same way with $KClO_3$ and HCl it was also converted, although with some reluctance owing to its compact nature, into a light brown chlorine compound soluble in alcohol. This ought to be sufficient to dispose of any lingering notions that coal is in any special sense carbonaceous. In many works coal is still spoken of as a form of carbon, but as we think with but little reason except its blackness.

There is another class of fibres to which I should like briefly to draw your attention.

Unlike jute they are not lignified, and therefore give no yellow coloration with aniline sulphate and no reaction with chlorine and sodium sulphite. They differ, moreover, in their percentage composition. Jute and fibres of that class contain a larger percentage of carbon than cellulose itself, whereas the class we are now considering contain less. We find, moreover, that on boiling with caustic soda solution a large quantity of the fibre substance is dissolved, and from the solution parapectic acid can be obtained as a gelatinous precipitate on adding an acid. This fact, together with the low carbon percentage, indicates that the cellulose has undergone a modification in the direction of the pectic group. Moreover, if such fibres be treated with a colourless solution of a so-called alkaline blue, which has but little dyeing action on jute, they very readily take on colour, showing that acid properties had been developed.

This observation has lately received a curious confirmation by an invention of a M. Witz, of Rouen. He has patented a process for so acting upon cellulose by means of oxidizing agents, that the portion treated shall possess the property of fixing certain colours.

We hope soon to be in a position to investigate some of the products M. Witz has thus obtained, and to which he gives the name oxycellulose. Before we knew of his patent, and, indeed, before it was published, we had published the result of an investigation of the action of oxidizing agents, chiefly nitric acid, on cellulose. We found if any form of cellulose is treated for some hours with 50 per cent. HNO_3, about 30 per cent. of it is converted into an amorphous body, which is perfectly soluble in solutions of alkali, from which it can be precipitated as a gelatinous mass, closely resembling pectic acid, and forming, when dry, a hard horny mass. To this body we had also given the name oxycellulose. It has invariably the same composition from whatever source it is obtained, and the results of the analyses point to the formula, $C_{18}H_{26}O_{16}$.

A comparison of the two bodies will be very interesting.

Such is a brief sketch of that particular branch of chemical investigation to which we have chiefly devoted our attention. The field is a very extensive one, and is

as yet but little worked, but it promises a rich harvest of both theoretical and practical results to the investigator.

Mr. Davies, F.C.S., said he had listened to the paper with considerable interest, and had great pleasure in moving that the best thanks of the Association be accorded to Mr. Bevan for same, and he also thanked him for showing samples of the different chemical products—many of which were quite new—which had been produced in course of Mr. Bevan's experiments.

The discussion was continued by Mr. A. C. Abraham.

Mr. Smetham and Mr. Bevan having replied, the vote was carried by acclamation.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

An open meeting of this Association was held in the Pharmaceutical Society's Rooms, Edinburgh, on Wednesday, January 9, at 9.15 p.m. Mr. Claude F. Henry, President in the chair.

The minutes of the previous meeting having been read and confirmed, the President called upon Mr. Thomas Stephenson to read a paper.

The Shale Products Industry.

BY THOMAS STEPHENSON.

In an introductory portion of the paper the author briefly referred to the discovery of paraffin by Reichenbach, and the independent discoveries of Christison and Dumas. He then gave an interesting account of the work of the late Dr. James Young in establishing the industry, as recently noted in this Journal.*

The characteristics of shale were then described, the author stating that "there is no line of demarcation between shale and coal, as a series of minerals of an intermediate description is to be found, regarding which it would be difficult to say whether they were shale or coal; but the two minerals, although occasionally found associated, are, as a rule, found occupying different tracts of country. Coal yields on distillation tar or bituminous matter, which is used as fuel and for gas making. Shale, on the other hand, gives a distillate suitable for refining into burning and lubricating oils, these products constituting quite a different series of hydrocarbons from those obtained from coal."

The various products obtained from shale were then briefly described, specimens being shown in illustration. It was stated that different shales yield varying percentages of finished products, but the following are a fair average:—

Gasoline	0·25	per cent.
Naphtha	3·00	,,
Burning oils	31·00	,,
Lubricating oils	20·25	,,
Solid paraffin	10·50	,,
Loss	35·00	,,
	100·00	

The skill or manner in which the process of refining is conducted considerably affects the yield.

He then proceeded to give the following account of the details of the process as it is carried on at the Oakbank Oil Works, near Midcalder, which he had an opportunity of visiting a short time ago.

"The shale is conveyed from the pits to the works by rail, a distance of about a mile. It is then passed through a breaker, which consists of two strong iron drums covered with strong iron teeth. These drums revolve against each other, the teeth passing through between each other. The shale falls between these drums and is consequently much broken up.

"After being broken it is conveyed in hutches, by means of a steam lift, to an elevated platform at the top of the retorts.

"These retorts are from two hundred and fifty to three hundred in number, and are arranged in sets of sixteen. They are charged by means of hoppers on the top, one hopper communicating with four retorts by means of a forked arrangement.

"The retorts used are known as 'Young and Beilby's.' Mr. Young, the manager of works at Pentland, and who, it may be mentioned, is no relation to the late Dr. James Young, the founder of the industry, and Mr. Beilby, the manager of Oakbank, each took out a patent about the same time for a new retort, and as both were very similar in construction and principle of working, it was arranged by mutual agreement that the patents should be conjoined, under the name of 'Young and Beilby's.'

"Each retort consists of a vertical cylinder, about 18 feet high, the upper part of which is made of iron and the lower part of fireclay. The lower ends of the retorts dip into a trough of water, which acts as a lute. Each set of sixteen retorts occupies one chamber, and is arranged on each side of the furnace in rows of four. The furnace does not reach higher than the fireclay portion of the retort, so that the upper part may not be exposed to too great a heat, the clay portion requiring a white heat.

"Besides the heat of the furnace a current of superheated steam is admitted to the fireclay part of the cylinder, and this helps to drive out the vapours as soon as they are formed, but it also serves another and more important purpose. The shale contains a quantity of nitrogen, which is held fast by the carbon. The purpose which the steam effects in the distillation is as follows:—It first of all enters the retort at the bottom of the clay portion, which, together with the shale contained in it, is exposed to a white heat. The steam is here decomposed. Its oxygen combines with the carbon of the spent shale (for the shale has been exhausted of oil before being permitted to enter the clay portion of the retort), forming carbon dioxide; while its hydrogen combines with the nitrogen previously held by the carbon, forming ammonia. This reaction takes place while the hydrogen and oxygen of the steam are in a nascent condition; but this chemical reaction, whereby we obtain the nitrogen as NH_3, must take place in the presence of a large excess of steam, which protects the ammonia as it is formed, and which, but for the presence of the excess of steam, would again be lost by decomposition. The excess of steam vapours now passes up into the iron part of the retort, and there greatly assists in the distillation of the oil from the shale, along with the ammonia obtained conjointly with the oil.

"The ammonia so produced has been found to be so valuable that it is in contemplation to recover it also from the ordinary coal used at present as fuel for heating the retorts, where, of course, the nitrogen is sacrificed. The plan to be shortly adopted, is to treat this coal in separate retorts, so as to produce coal gas, which is to be employed, along with the uncondensable gas from the shale, for the purpose of heating the shale retorts. The ammonia, of course, is secured in this process, and it is calculated that about 7*s.* 6*d.* worth of ammonium sulphate can be obtained from 3*s.* or 4*s.* worth of coal, so that the coal, instead of as formerly, being at the debit side of the account, will really prove a source of profit to the company.

"The shale is first heated to a low red heat in the iron part of the cylinders. In this way the oil is distilled. As the process goes on the shale subsides down towards the fireclay portion, where it is heated to a white heat by the naked flame of the furnace. It is here that it meets with the superheated steam which separates the nitrogen. By the time it reaches the water it has been thoroughly exhausted of all its value, and can be withdrawn from the bottom. The cylinders are charged from the top every three or four hours with raw shale, and on each occasion the fireclay portion is still full of partially or

* *Pharm. Journ.*, [3], vol. iv., p. 762; also present vol., p. 198.

entirely exhausted material. The advantages of this arrangement are mainly the adjustment of the degree of heat necessary to convert the whole of the shale into the desired products, instead of into gas, and in the production of ammonia, which, from a pecuniary point of view, is the most important product of all.

"Although the Henderson retort is not used at the Oakbank works, a description of it may not be out of place, as it is mentioned in all books on the subject as being the best and most widely used. It is, however, by this time entirely superseded by that of Young and Beilby. It consists of a vertical iron cylinder about 15 feet long. Instead of a water-lute at the bottom, there is a door which opens into the furnace. The shale, after being exhausted of oil, is admitted, by means of this door, into the furnace, where it is utilized as fuel to a certain extent. The residual shale is different from all others, in that it has a reddish tinge and is very fragile. The great drawback of this retort is that in utilizing the carbon as fuel, the nitrogen, and, consequently, the ammonia, must be, in great measure, sacrificed.

"To return to the Oakbank process, the vapours, after leaving the retorts, are conveyed through a series of upright tubes fitted in a trough, where they are condensed and conveyed to a 'separator.' This is a tank with two exit pipes, one from the bottom and another from near the top. The oil, being lighter, floats on the surface and leaves by the upper opening, while the ammoniacal liquor leaves by the lower one.

"The gases, which have passed unaltered through the ordinary condensers, yield, on being subjected to pressure, or passed through a coke or spray tower, a very volatile liquid termed *gasoline*.

"The ammoniacal liquor, which is drawn off from below the oil, is led away to a separate house, where it is passed into a '*dephleymating still*,' which consists of a vertical cylinder having a series of perforated transverse plates inside, which divide the ammoniacal liquor into small drops as it passes down. A current of stream is admitted into the still at the bottom. This lifts the ammonia, so to speak, and carries it away to the saturators, which are wooden boxes lined with lead, and containing sulphuric acid. The steam, carrying the ammonia with it, is passed through the sulphuric acid, which combines with the ammonia to form ammonium sulphate, the process being continued until the vapours begin to smell of ammonia.

"This liquid, which contains sulphate of ammonia, is removed to large vessels, where it is evaporated down by means of a coil of steam pipe extending throughout the liquid, the crystals being ladled out as they form. The sulphate is then removed to a drying shed, and, after remaining there for about a week, is ready for the market, and is sold at about £18 or £20 per ton, realizing a handsome profit.

"The *crude oil*, consisting of the solid distillate in the process I have detailed, is then distilled completely in stills which have cast iron pot-shaped bottoms, and which are capable of holding 1200 to 1400 gallons each. The distillation is effected by steam blown into the oil. The product is 'green oil,' a very fine pure coke remaining in the still.

"This green oil is subjected to treatment with sulphuric acid and caustic soda. In order that as little sulphuric acid as possible may be used, the oil must first be separated from water, as far as possible, as this would weaken the acid and thus cause more to be used. The oil is agitated with the sulphuric acid in cylindrical vessels furnished with paddles inside, the agitation being assisted by means of air blown up through the oil from a perforated coil of pipe in the bottom of the agitator. It is then run into other agitators of a similar construction, where it is treated with caustic soda. This treatment has the effect of reducing the specific gravity of the oil from ·860 to ·830–·845; and it also reduces its bulk about 15 per cent.

"It is then pumped into large cylindrical stills capable of holding 4000 gallons, and furnished with condensing worms, where it is subjected to fractional distillation.

"The *naphtha* first comes over, and is led away into a tank by itself. The *burning oil* next comes over and is also led away to a separate tank. The heavy *lubricating oil* is the last to distil over, and the residue in the stills again consists of *coke*.

"The naphtha is rectified by being first treated with acid and soda and then redistilled.

"The burning oil is also treated with acid and soda and redistilled, the first portion being mixed with the crude naphtha, and the last with lubricating oil, and they are both kept separate. The middle, or '*burning oil*' portion is removed to tanks where it is subjected to treatment with sodium carbonate. This has the effect of causing any solid matter held in suspension to fall to the bottom as a sediment, leaving the oil clear. In about twenty-four hours the bottom of the tank can be seen distinctly through the oil, which is then clear, bright and almost colourless.

"For the production of *paraffin*, the lubricating oil, obtained in the first fractional distillation, is allowed to cool, when the substance known as '*hard*' *paraffin scale* crystallizes out. This is separated by passing the oil through a series of sheets of canvas, stretched on iron frames, placed side by side in a long trough, forming an arrangement not unlike a toast-rack with the sides covered in. The scale is then placed between other sheets of canvas and subjected to hydraulic pressure, in order to separate as much oil as possible.

"The oil which is pressed from the scale is then led away to a refrigerator. This consists of a trough in which the oil is placed, and a drum which revolves in the oil, and which contains gasoline. The gasoline is evaporated by means of a powerful pump, and this evaporation so cools the oil, that all the paraffin it contains at once crystallizes out, and is scraped off by a fixed knife placed at the edge of the drum.

"This paraffin scale has a much lower melting point than the former, and is therefore called '*soft*' *paraffin scale*. It is separated from the oil in a manner similar to that employed for the hard scale.

"The oil which is separated from paraffin (called 'blue oil' from its colour) is then removed, and after treatment with acid and soda, and fractional distillation until the desired specific gravity is obtained, it constitutes '*lubricating oil*.'

"I have now only to allude to the further treatment of the paraffin scale.

"A quantity of the soft scale is mixed with the hard, to reduce its melting-point, but most of it is sold to match manufacturers for saturating the wood in order to render it more inflammable. The scale is then washed repeatedly with naphtha, to dissolve out the oil, both naphtha and oil being afterwards recovered. After treatment with animal charcoal or some similar substance, it is melted and run into cakes, which constitute the well-known 'solid paraffin.'

"Vaseline has never been successfully manufactured from any of our shale products. It is got by a special process of filtration through animal charcoal, from the residue obtained after the distillation of the burning oil from American petroleum.

"The 'spent shale' consists principally of silica and alumina, with traces of iron, and has never been turned to any practical account. It accumulates in vast heaps close to the works. Perhaps these heaps, some of which weigh many millions of tons and tower to a height of several hundred feet, may prove a puzzle to our geologists a few centuries hence."

The paper was well illustrated by coloured sketches of working plant, tables of percentages and a full series of specimens, which those present had an opportunity of inspecting during an interval in the proceedings.

The President moved a vote of thanks to Mr. Stephenson, referring to the interesting manner in which the subject had beeen treated. The motion was seconded by Mr. Dunlop, and after several others had commented on the subject, Mr. Stephenson replied.

Mr. A. Robbie then read an exhaustive paper on "Cod Liver Oil," in the course of which he gave some interesting details of the cod fish industry as pursued in Newfoundland, Norway and the coast of Scotland. After referring to the various methods which had been employed from time to time for the extraction of the oil, he gave an account of the methods now adopted, and stated that the superior quality of Norwegian oil is rather due to better quality of fish livers than any superior method of manufacture. After commenting on the chemistry of the oil he noticed briefly its pharmacy and therapeutics and concluded with some remarks on the causes of the present small supplies of the oil.

The paper was fully illustrated by specimens.

A vote of thanks, moved by the President and seconded by Mr. Wood Ainslie, was heartily accorded to Mr. Robbie, and a discussion followed, in which Messrs. Crowden, Dunlop, MacEwan, and others took part.

This was all the business, and after the President had commented on the satisfactory manner in which two apprentice members had acquitted themselves that evening, he intimated that the next meeting would be held on the 30th instant, when a paper on the "Official Alkaloids: their Chemistry and Preparation" will be read by Mr. John R. Hill. The meeting then adjourned.

YORK CHEMISTS' ASSOCIATION.

The annual meeting was held on the 27th ult., at the rooms, High Ousegate. The proceedings were of a formal character. A resolution was passed expressing regret at the loss the Association has sustained by the death of the late President, Mr. Councillor Davison. The names of Messrs. Humphreys, Gubbetis and Boyes were added to the Committee. The following officers were elected for the current year:—President, Mr. J. Clark (of Messrs. Langton, Edden, Hicks and Clark, London); Treasurer. Mr. J. Sowray; Secretary, Mr. T. W. Hodges.

Parliamentary and Law Proceedings.

Poisoning by Hydrocyanic Acid.

Mr. S. Hacker held an inquest on Friday, January 11, at Newton Abbot, touching the death of Mrs. Jane Pinsent.

From the evidence it appeared that the deceased was found by her brother fully dressed, lying on her bed, unconcious and apparently dying. He gave her some brandy and applied a hot water jar to her feet, but she expired within ten minutes from the time he first saw her. On the mantelpiece he found a small dark bottle, with a glass stopper, labelled "poison." He inferred from that the bottle contained laudanum and that the deceased had poisoned herself. The bottle was here produced, and the label on it was as follows:—"Hydrocyanic acid (of Steele's strength), dose 1 to 4 minims. Layman and Umney London." Witness, continuing, said he believed the deceased was on the best terms with her husband and her mother; and although she had overdrawn her banker's account there was nothing for her to trouble about. In fact everything had been set right.

Mr. Scott, surgeon, said that he saw the deceased about six o'clock on the previous evening; life was then extinct, the deceased having to all appearances been dead for about an hour. Mr. May drew his attention to a bottle on the mantelpiece, which, on examining, he found to have contained prussic acid of twice the ordinary strength. and a small dose of which would be sufficient to cause death. He had no doubt, judging from the livid appearance of the body, that death had arisen from that cause. He subsequently made a *post-mortem* examination, which left no doubt in his mind that death was caused by prussic acid.

Mr. Bibbings, chemist, stated that the deceased had been a customer of his for about five years, and was consequently well known to him. On Wednesday morning, about 11.30, she entered his shop and purchased several articles. Among these she asked for some prussic acid, and said that she was going to poison a favourite dog which someone had given her, but which she did not wish to keep. He cautioned her, and told her not to let the poison go out of her hands on any account. She promised that she would be very careful with it, and he let her have about six drachms, just enough to kill a dog. He did not make an entry of the transaction in the book provided as he had known the deceased so long.

The Coroner here cautioned the witness as to future similar transactions, and witness promised to insist on the entries being signed by the applicants.

The Jury returned a verdict of "Suicide while in a temporary state of insanity."—*From the Western Morning News.*

Alleged Poisoning by Laudanum.—The Duty of Chemists in respect to Dirty Bottles.

On Saturday, December 12, an inquest was held at Maryport, before Mr. W. W. Lumb, Coroner, on the body of Mary McWilliams, aged ten weeks.

Elizabeth McWilliams, mother of the deceased, said the child had been ailing since birth. She got a pennyworth of mixture from Mr. Smith, chemist, Maryport, on Tuesday night. The bottle which she sent had contained laudanum, but nothing was in when she sent it. She gave the child the whole of the mixture at five times. It had the last dose nearly twenty-four hours before it died. She did not wash out the bottle which had contained laudanum, but drained it. She did not observe that there was any left in the bottle.

Dr. John Crerar said he was requested to visit the deceased on Thursday morning, about seven o'clock. His assistant went immediately, and from what was afterwards said to him he went himself in the forenoon. Dr. Crerar continued: I found the child very heavy and sleepy, skin pallid, pupils firmly contracted, and presenting the ordinary symptoms of opium poisoning. It had had convulsions, which are not infrequently present in cases of opium poisoning in infants, but it was denied that any laudanum had been given to the child. After some little time I elicited the fact that it had had something from a druggist. The bottle got at the druggist's was produced. It was empty, and labelled "Infant's Mixture." After directing the necessary treatment, though the case was apparently hopeless, I called at the druggist's, and found the stock bottle from which the mixture was supplied. It was quite innocuous. This was a little puzzling, but the fact that the child had had opium was clear. On partially removing the label from the bottle, a dark-red label was revealed underneath. This was marked "Laudanum—Poisonous," and was probably the source of the opium which had poisoned the child. The bottle belonged to the parties themselves, and had probably contained a portion of a previous purchase. The child undoubtedly died from opium poisoning. I could not, therefore, give a certificate. It should be well known to the public that opium, in all its forms, is a very dangerous and potent agent in the case of infants. Notwithstanding this, the administration of opium, generally as laudanum, to infants, prevails extensively. It is a favourite remedy with foolish mothers and ignorant nurses. Most of the soothing syrups and other remedies to quiet children contain laudanum as the active ingredient. They are very convenient and effective, but they

are also a frequent cause of frightful mortality among infants. Some druggists wisely refuse to sell laudanum when the intention is declared to give it to young children. Others are not equally careful.

The Coroner said the jury ought to have the person who had served the mixture in the chemist's shop, and ascertain if there was anything like laudanum in the bottle at the time he put in the "Infant's Mixture."

The Jury agreed to this, and the inquiry was adjourned.

On resuming, Joseph Robert Comyns, of Furnace Cottage, Maryport, aged 17, who is apprentice to Mr. Smith, chemist and druggist, High Street, was called. He said he had been with Mr. Smith over three years. He did not remember a boy going to the shop on Tuesday night for a pennyworth of cough mixture, but he might remember the lad if he saw him. He did not recollect having seen the bottle produced before, although it had a label marked "Laudanum—Poison" on it.

The Coroner: Suppose you had seen a bottle with "laudanum" marked on it, what would you have done with it?

Witness: I should have seen there was no laudanum in before I put in the mixture.

I was just going to ask you that. Suppose the boy brought you the bottle and it was dirty, like this, would you have washed it out?—No, I should have simply seen that it was empty.

How many drops of this mixture are there in the bottle now?—Ten to fifteen drops.

And there might have been that quantity of laudanum in the bottle which you might not have noticed?—I should have seen that the bottle was perfectly empty. We never serve laudanum or any poisonous thing to children.

The boy, McWilliams, who purchased the mixture was called, but Comyns said he did not remember him. McWilliams said Comyns served him with the mixture out of a large bottle. In reply to the coroner the lad further stated that he was certain there was nothing in the bottle, because his mother had previously drained it into the grate.

The Coroner said they would all agree with him that Dr. Crerar was quite right in not giving a certificate under the circumstances. There was no doubt the child was poisoned, but so far as he could see there did not appear to be any blame attributable to anyone. Still it was clear there had been laudanum in the bottle when the mixture was put into it at Mr. Smith's. The fact that there was a laudanum label on the bottle should have put the young man on his guard, and all persons in druggists' shops should use the greatest care when such bottles were taken to them. They should either wash the bottle out before putting the stuff into it, or else take the dirty bottle and give a clean one, and afterwards wash the bottle at the shop. If there was blame in the case it was certainly on the young man Comyns, who should have washed out the bottle, or at least have taken greater care. Had he washed out the bottle or given a clean one, in all probability the child would have been living now. Dr. Crerar was perfectly right in withholding the certificate, as it was a proper case to be inquired into by a coroner and jury. He trusted that persons would read the evidence given in the case and act accordingly. They were all liable to make mistakes, but on that bottle there was a label which was sufficient to put any person on his guard and make him very careful. There was no culpable blame attached to anyone; it had only been carelessness. He thought the jury might make a recommendation, because there were many of those cases, that the greatest possible caution should be used, and that druggists and others should not put perfectly innocent mixtures into dirty bottles.

The Jury returned a verdict that the child died from poisoning by laudanum having been left in the bottle through the carelessness of both the mother and the druggist's assistant. They added a recommendation as suggested above by the coroner. They did not find anyone culpably negligent, but there had been a great deal of carelessness revealed, and druggists should be careful to either wash out the bottles when dirty or give new ones.

The Coroner said he thoroughly agreed with the remarks that had been made, and he hoped they would have a good effect on the public.—*West Cumberland Times.*

Reviews.

PLANT ANALYSIS: Qualitative and Quantitative. By G. DRAGENDORFF, Ph.D. Translated from the German by HENRY G. GREENISH.*

This is a capital book, and one which we welcome as being a step forward in a much neglected branch of analysis. We have here a scheme of plant analysis which will be found of great assistance to students, who we fear have hitherto regarded plant analysis as quite beyond their border. The plan adopted by the author has been that of separating the constituents of the plant as far as possible by means of different solvents, thus following a method which is familiar to those conversant with plant analysis; but he has extended it so far as increasing the number of solvents and in varying the order in which the solvents are allowed to act on the substance under examination. In this way the plant constituents are separated, as it were, into six groups, which are obtained by the successive application on the plant material of the following solvents:—

1. Petroleum spirit (b. p. 45°), extracting ethereal and fatty oils, wax, etc., and, what is often overlooked, any chlorophyll and alkaloid dissolved in the fatty oil.
2. Ether: resins and their allies.
3. Absolute alcohol: resins, tannin, bitter principles, alkaloids, glucosides, etc.
4. Water: mucilage, acids, glucoses, saccharoses and other carbohydrates, albuminous substances, etc.
5. Dilute soda: metarabic acid, albuminous substances, phlobaphenes, etc.
6. Dilute hydrochloric acid: pararabin, calcium oxalate, and starch.

The material of the plant which remains may consist of lignin and allied substances and cellulose. Each extract is then exhaustively dealt with for the isolation of its several constituents.

In Part II. we find special methods for the estimation of certain constituents of the plant, it consisting, in fact, of supplementary notes to the first portion of the work. This part commences with a method for the estimation of fixed oils, and an account of their behaviour to reagents; then passes on to ethereal oils, resins, tannins, alkaloids, the sugars, amines, acids, albuminoids, starch, etc, and the work is completed by tables giving the percentage composition of the constituents of plants mentioned throughout the work, arranged in one case alphabetically and in the other according to percentage of carbon.

This, briefly, is the broad outline of the plan followed by Professor Dragendorff.

It is almost superfluous to say that the author has made the very best use of the material, insufficient as he deems it, at present available for the construction of a systematic process of analysis, and no one is more conscious than he of the necessity of sifting and improving the methods described. For this purpose the student will find copious references in foot notes to authorities or to papers; in fact, every page bristles with them.

To show the exhaustive character of the work, it may suffice to mention that for the determination of tannin

* London: Baillière, Tindall and Cox. Demy 8vo. Pp. i–xvi., 1–280. Price 7*s.* 6*d.*

in the absolute alcoholic extract there are no less than twelve methods passed in review.

It is to be desired that this redundancy of methods may not defeat its purpose and serve to perplex rather than to assist the student, and this it is very apt to do unless the student possesses more than ordinary discriminative ability. Where all is so satisfactory it would be supererogatory to particularize portions; but we may mention that the alkaloids are treated of very accurately and succinctly, and the methods for the separation of the cinchona alkaloids are, as far as they go, trustworthy, and leave no pitfalls for students.

The admirable manner in which Mr. Greenish has translated the work deserves more than a cursory notice. There is perhaps one hastily compiled sentence on page 63, where we read, "To the filtrate, together with 100 c.c. of wash alcohol, the results of two following extractions, each with 250 c.c. of spirit, and 100 c.c. washings are added." Again, China nova tannic acid is literally correct, but if chinovagerbsaüre be the word in the original, use has made us accustomed to quinovintannic acid in the same way as chinovasaüre gives quinovic acid. These, however, are only trifling blemishes that can easily be removed if the work reaches a second edition. Meanwhile we heartily congratulate Mr. Greenish upon the successful translation that he has furnished of a very valuable book.

YEAR-BOOK OF PHARMACY: comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry contributed to British and Foreign Journals from July 1, 1882, to June 30, 1883. With the Transactions of the British Pharmaceutical Conference at the Twentieth Annual Meeting, held at Southport, 1883.*

The "Year-Book" issued to the members of the British Pharmaceutical Conference is so well known and so fully described in its title, and has now been for so many years compiled by the same able editor, that little comment requires to be made upon the appearance of a new volume. If the one under notice varies in any respect from its predecessors, beyond being somewhat more bulky than usual, we think it is in containing a larger number of extracts, made more briefly than used to be the case, and in the chemical section covering a wider field. The comparative paucity of important communications upon the vegetable materia medica is noticeable, and quite confirms a remark made in our recent summary of the year 1883. The volume is prefaced by the usual sixteen pages of "Introduction," which, by the way, it is difficult to keep free from an appearance of cataloguing, and there are about the same number of pages devoted—rather wastefully—to the section of "Bibliography." The latter part of the volume, consisting of the report of the meeting at Southport, has already been published in this Journal. A few errors have crept in here and there, as indeed they will in spite of careful reading. Thus the quotation of an English abstract of a French paper through a German journal, on p. 92, has resulted in shortening the name of an author by a syllable; but he is more fortunate than Mr. Thiselton Dyer, quoted on p. 215, who is robbed of his surname altogether. Readers who are partial to symbolical conundrums will find a nut to crack on p. 553.

NOTES AND STATISTICS OF CINCHONA BARK. By JOHN HAMILTON, F.S.S. Second Edition.†

On the appearance of the first edition of Mr. Hamilton's pamphlet we took the opportunity of referring at length to some of the information contained in it. The statistics have now, in respect to the leading countries, been brought down to 1882, and in one or two cases to the middle of 1883, while the number of pages has been quadrupled by the addition of various interesting items of information concerning the cinchona plant, wild and cultivated. From the statistics it is seen that Great Britain continues to be the most important centre of the bark trade, the quantity imported into the United Kingdom having amounted to 15,599,920 pounds, or upwards of a million and a half pounds in excess of the imports of the previous year, this excess being equal to three-fifths of the total imports in 1871. Of this quantity the author estimates that as much as 6,638,352 pounds was reserved for home use. It is not quite clear how this figure has been arrived at, but by deducting the exports (8,961,568) from the imports (15,999,920) one exactly 400,000 higher is obtained. France is said to have imported during the same time 10,063,319 pounds and consumed 4,866,081. The other large consumers are Germany, which is credited with having used 5,674,680 pounds, and Italy with 6,150,000 pounds. The United States again shows a falling off of about half a million pounds in its import of bark, which in 1882 did not reach two-thirds of the quantity imported before the abolition of the protective duty on quinine.

In looking through these statistics it becomes evident that they can only be accepted as representing the facts approximately, and even for this result the author is entitled to considerable credit. They are, however, sufficient to show that—apart from such incidents as the advent of a new bark, like the cuprea, on the market—the demand is keeping place with the increased supply, and that there is not much probability that for several years to come the yield of wild and cultivated barks united will be in excess of what is required.

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* London: J. and A. Churchill. 1883. Pp. i.–x., 1–672.

† London: J. W. Collings and E. W. Allen. 1883. Demy 8vo. Pp. 1–68. 3*s.* 6*d.*

Correspondence.

THE BOTANY OF CINCHONA LEDGERIANA.*

Sir,—On May 3, Mr. J. E. Howard read a paper on this subject before the Linnean Society, and within the four months following he has found it necessary to publish two additional papers† to endeavour to explain successive changes in his opinions. These changes have resulted from "new light" obtained in instalments from different sources and of varying brilliancy:—the specimens and publications of Mr. T. N. Christie, of Ceylon, the visit of Mr. Ledger to England, and the publication of Mr. Moens' 'Kina cultuur in Azië.' Now, at length, the first paper is published,‡ considerably shorn of whatever importance it may have originally had; but this also has an "addendum," undated, but apparently written in August. It may be regretted by some Fellows of the Society that the author did not refrain from printing views which he had so modified since he expressed them. I presume, at all events, that in endeavouring to ascertain what really are Mr. Howard's present ideas on the nature of *C. Ledgeriana* (no easy task), I shall be right to take the statements and suggestions contained in the paper latest in date, that, namely, which, under the rather sarcastic heading of a "Brief Note," he contributed to your columns. To assist the exegesis I shall, however, have to avail myself of the earlier papers also.

When in September, 1881, I prepared the description of *C. Ledgeriana*, Moens, MSS., which was printed in my

* This communication was written more than a month before Mr. Howard's lamented death, and two before the news of that sad event reached Ceylon. The delay in its publication has been due to the kindness of the Editor, who forwarded me a proof, thinking that under the circumstances I might wish to revise it. It is probable that I might have availed myself of the opportunity and made a few verbal alterations, were it not that, after having allowed sufficient time to elapse for, as I supposed, the appearance of the paper in this Journal, I forwarded a copy to the *Ceylon Observer*, and in this it was published on November 26 last. Under these circumstances I leave the paper unaltered as written.—H. T.

† *Planters' Gazette*, August 16, 1883, pp. 983-4; and *Pharmaceutical Journal*, September 1, 1883, pp. 178–180.

‡ *Journ. Linn. Soc.*, xx., p. 317 (issued Sept. 24, 1883).

Journal* for November, the only published botanical information was Weddell's description in Howard's 'Quinology.'† It does not appear whether Weddell saw any specimens, or whether he drew up his diagnosis merely from Fitch's three fine drawings made from dried plants from the Java plantations; he allows that the characters he gives are "not weighty ones," and, indeed, those plates would not be sufficient alone for discriminating *Ledgeriana* from Calisaya.‡ The plant thus remained as very probably merely one of the pseudo-varieties of the bark-dealers which might not possess any botanical characters sufficiently definite to be able to be distinguished in the field or in the herbarium. In Java no doubt they knew better even then, but that was the state of information prevailing in England and India when I came to Ceylon at the beginning of 1880; and to the frequent and urgent requests of the growers of bark-trees to say whether such were "*Ledgeriana*" or not I found it impossible to give any positive answer.

Mr. Moens visited Ceylon in September, 1880, and it is to him I am indebted for having first pointed out to me that the plant had good definite characters. These were familiar to him in Java as distinguishing all the best and most marked trees which had come from Ledger's seed,§ and so soon as I was satisfied that they held good in Ceylon I lost no time in making them public. My description was based on the examination and comparison of numerous fresh specimens; and it was an additional proof of the correctness of the name, that the plants yielding them have all without exception been traced back to Ledger's seed.

In making (after consultation with Mr. Moens) Weddell's variety into a *species*, I expressed some compunction for adding yet another specific name to this already overburdened genus, but I gave what I thought good reasons for the course followed and I may now add that further experience has justified it.‖ Mr. Moens' own description has now appeared;¶ it is much fuller than mine, but differs in no other respect from it.

Yet Mr. Howard asserts in his two earlier papers that my plant is not *Ledgeriana*, but a variety of *C. micrantha*. It is true that in his most recent paper he acknowledges he "may be mistaken" in this extraordinary determination; in making it one can only suppose that he could not have read my description with any care; but, looking only at the figures accompanying it and remembering a former error of his own,** at once accused me of a similar blunder. But having supplied a full definition I must be judged by that rather than the plates accompanying it. I expressed in the paper my regret that I should be forced to figure so poor and ill-grown a specimen, but it was the best I could get at the time, and the tree, apart from its stunted growth, was considered by Mr. Moens as a very characteristic example of the species. Mr. Howard, further, has matched these figures of mine with one published in August, 1873, in the *Bot. Magazine* (tab. 6052) under the name *C. calisaya*, var. *Josephiana*, Wedd. This figure was made from a plant which flowered in Mr. Howard's conservatory in 1872, having been received from Kew. In the text accompanying the plate, Dr. (now Sir) J. D. Hooker tells us that the plants were brought from South America, by Pearce, in 1866, and that several wardian cases of them were sent to India in that year. He also says that it seems to be "intermediate between *Calisaya* and *micrantha*," but that Mr. Howard, after first thinking it var. *calisayoides* of the latter species, afterwards agreed with Dr. Weddell in calling it *Josephiana*. Mr. Howard now says, "I should myself have preferred calling it *C. micrantha*, var. *calisayoides*;" but it is remarkable that in 1876, when he himself published another figure ('Quin. Ind. Plant,' t. 9) of identically the same plant in his green-house, he should still give it the name of "*Josephiana*, var. *glabra*." Nor in the accompanying text (p. 86), does he say a single word about it being more properly a variety of *micrantha*. Both these plates show a plant with large erect white flowers and clavate buds; and what resemblance Mr. Howard can have seen between them and the figures accompanying my paper I fail to understand. No wonder Mr. Ledger "rejected" this plant. Mr. Howard does not tell us why he prefers to put it under *micrantha*: so far as the leaves go, it seems more rightly put under "*Josephiana*," where I see Mr. Moens also places it.* Ripe fruit would help to determine this point.

Of the other (or the same?) recorded intermediates between *Calisaya* and *micrantha*, extremely little is known.† Of the one called *C. Calisaya*, var. *pallida*, Wedd., no description or figure has been published; of the other, called *C. micrantha*, var. *calisayoides*, a very brief diagnosis by Weddell is all that we have. They are allowed to approach one another extremely closely in foliage, and the bark of each seems to have been called "*Calisaya blanca*," but I have no means of determining whether they be identical.

The next point Mr. Howard remarks upon is that no analysis of the bark of the tree figured by me was given, and appears to think this a serious omission. Can he mention any other genus of plants where it is necessary to give such an analysis in describing a new species, and if not, why should it be required in *Cinchona*? However important it may be in other respects, I attach no value to chemical composition as defining species or varieties. We know, indeed from experience, that out of ten trees with the characters Mr. Moens and I have pointed out, probably nine will yield a large, though variable, percentage of quinine almost unmixed with the other alkaloids; but the other one may be as poor as an ordinary *Calisaya*. It is true that the bark of the actual tree figured was never analysed; but it was one of a row of several, all of precisely the same botanical type, and the analysis of the bark of some of these has been published by Mr. Agar, the proprietor.‡ The analysis, as it happens, was made by Mr. Howard, "who pronounced it to be *Ledgeriana* bark."

Now, as to the magnificent pictures illustrating or forming the basis of Weddell's diagnosis of var. *Ledgeriana*; they are no doubt fine examples of Fitch's work, and one cannot but admire the skill which can produce such restorations from the dried mummies in a herbarium. But it is risky work, and the botanist is but too familiar with the want of that sort of accuracy which he particularly needs, so often to be seen in the work of even the best botanical artists. In these plates none of the characteristics of the flower of *Ledgeriana* are accurately shown so as to be beyond dispute; the points missed are just such as would be likely to escape an artist unless his attention were drawn to them, and they were not then known to Mr. Howard himself. Nor has the artist caught the *facies* or habit of the plant any better than the details (as may very well be seen by comparison with the phototypes illustrating Mr. Moens' 'Kina cultuur'), whilst the gaudy and inaccurate colouring makes them still less like reality.

It is necessary to say thus much about these plates, because Mr. Howard seems to regard them as so accurate as to justify him in speaking of them as though they superseded type specimens of plants themselves. This appears when we endeavour to ascertain what, after all, he considers his var. *Ledgeriana* to really be botanically. It is, he says, to be restricted to "the *Rojo* bark of Ledger," which is "one of Dr. Weddell's second division of *C. Calisaya*;"§ further, it is Howard's "form A. (plate iv.),

* *Journ. Bot.*, xix., pp. 321–325.

† 'Quin. Ind. Plant.,' p. 85.

‡ Mr. Howard himself candidly avowed that, to him Ledgeriana's character was stamped "by its great productiveness in pure quinine" (*l.c.*). Dr. Weddell did *not*, however include this in his definition.

§ It is perfectly well known that this seed was not all the same. There were some very bad trees of quite another type among those from the original sowing.

‖ The dignity of "species" varies considerably in different genera, their characters being inevitably lighter in such very natural genera as *Cinchona*. In fact *C. Ledgeriana* is pretty much on a level with most of the other accepted species in the genus.

¶ 'Kina cultuur in Azië,' pp. 75–77.

** See his paper, *Jour. Linn. Soc.*, p. 319.

* 'Kina cultuur,' p. 84.

† This little is to be found in the introduction to Howard's 'Illustrations,' p. v., and in Weddell's 'Notes,' in *Ann. Sc. Nat.*, ser. 5, xi., 361, and xii., 51 and 57. Triana (*Nouv. Et.* pp. 62, 75) puts both under *C. micrantha*.

‡ *Ceylon Observer*, June 24, 1883. They gave 7 per cent. pure quinine and only a trace of other alkaloids, being then four and a half years from planting out.

§ That is of an amplification by Howard of *C. Calisaya*, var. *microcarpa*, Wedd., described in *Ann. Sc. Nat.*, *l.c.*, p. 54, with the vernacular names of "*Calisaya Zamba*" and "*Zambita*."

exclusive of B. and C." (plate v. and vi.), and therefore only in part the var. *Ledgeriana* of Weddell and the *C. Ledgeriana* of Moens. In fact it is a *picture* (plate iv.) merely, selected it would seem, by Mr. Ledger, as the most like what he remembers or supposes these "*Rojo*" trees to be; that is all. This plate represents a robust plant with large erect flowers.

But Mr. Howard's restricted *Ledgeriana* is still further narrowed down. Plate iv. happens to have been made from a short-styled plant, and it chances that Dr. Weddell's diagnosis was also drawn up from one. Mr. Howard prefers, with the natives, to call this form "macho," and really believes that it is *male* in some more especial manner than the long-styled form, which the untutored Indians and he term "hembra" or female. It seems scarcely credible that he can seriously propose to restrict his *Ledgeriana* to the short-styled state, but he distinctly says that "it is exclusively the *macho* form." Mr. Howard has been led to the *reductio ad absurdum* of giving a definite botanical name to a mere sexual condition probably incapable of self-fertilization, simply on the faith of Mr. Ledger's opinion as to plate iv. The latter gentleman (or rather his native servant) was also much struck with the *colour* of another plate (tab. x.) representing the hybrid, *C. anglica*. This reminded him of the colour of "Rojo," and Mr. Howard at once jumps to the conclusion that the two are "very nearly related;" but as this plate x. happens to be drawn from a long-styled form, or "is very decidedly *hembra*," as Mr. Howard puts it, it "cannot come under Weddell's diagnosis."

We may, however, feel very certain that Dr. Weddell, in 1875, when he drew up the definition in question, was not intentionally creating a variety on what was then well known to be a merely physiological condition; to support the position that he did so, Mr. Howard quotes remarks written by that excellent botanist in 1849 when the nature and relationships of dimorphic or heterostyled flowers (so frequent in *Rubiaceæ*) were not properly understood; it is noteworthy that in 1869 Dr. Weddell had deliberately dropped the bark-cutter's term "macho," which he then no doubt saw to be misleading.

One sees with regret throughout all these communications of Mr. Howard, a very remarkable neglect, or an intentional defiance of the accepted rules of botanical nomenclature. For instance, he makes the astounding remark that "it belongs to Mr. Ledger and to him alone to define what is the true *Ledgeriana*." Why? On what possible grounds? Mr. Howard has said a little before, and fairly enough, that "the privilege of naming a plant belongs to the botanist who first observes and properly describes it;" this may pass, but how in the world can it apply to Mr. Ledger?

In conclusion, a few words as to the Ceylon cinchonas spoken of by Mr. Howard. He has committed himself to the following identifications:—(1) the plant figured by me = *C. micrantha*, var. *calisayoides* (probably); (2) Mr. Christie's specimens (S. Andrew's Estate) = *C. Calisaya*, var. *microcarpa* (but probably hybridized with *C. officinalis*); (3) Mr. Laurie's (Yarrow Estate) = *C. Calisaya*, var. *Ledgeriana*. Now, I am familiar with these. They are all from the same small quantity of seed, and were raised in the same nursery beds at the same time, and I can state positively that they are *all botanically identical*. Further, they are also identical with what is and always has been known as *Ledgeriana* in Java, and as *Ledgeriana* (species or variety) was founded on the plants in Java and has never yet been applied to any wild South American tree, the Ceylon plant must of course bear the same name. I regret the amount of ink—shed over so simple a matter.

Peradeniya, Ceylon. HENRY TRIMEN, M.B., F.L.S.

THE SOLUBILITY OF CALCIC HYDRATE.

Sir,—In a valuable paper by Mr. Maben on the solubility of calcic hydrate, published in the Journal of December 29, that gentleman, whilst to some extent confirming the results which I communicated to the Liverpool Chemists' Association, in November, 1882, differs from them in some respects, and produces figures so contrary to what might be expected that I have thought it right to make some further experiments.

The most important and startling statement is as follows:—

"I have found that lime-water can be made of full strength with calcic hydrate mixed with 15 per cent. of carbonate; with equal parts of hydrate and carbonate I obtained ·5 grain CaO per fluid ounce; with 25 per cent. hydrate and 75 per cent. carbonate ·4 grain, and with 10 per cent. hydrate and 90 per cent. carbonate the amount dissolved was only ·1 grain."

On reading this it at once occurred to me that Mr. Maben had either used an insufficient quantity of lime, or had not given sufficient time for the saturation to take place with the smaller proportions of hydrate.

To test this I had some fresh hydrate of lime prepared, and mixed this with the various percentages of precipitated chalk indicated by Mr. Maben. These mixtures were taken in such quantity that in every case the same proportion (viz. 100 grains) of the hydrate should be present with each pint of distilled water; practically the proportions of the Pharmacopœia.

These mixtures were shaken occasionally during an hour or two and then set aside for twenty-four hours, after which 2000 fluid grains were drawn from each with a pipette and estimated. The results are shown in the table.

No. of sample.	Percentage of $CaCO_3$ present	Constituents used with 1 pint of distilled water.		Fluid grains of ½ strength. Vol. sol. oxalic acid required for 2000 fluid grains.	Reduced to terms of B. P. standard, viz., 200 fluid grains for 10 fluid ounces.	Temperature.
		$CaOH_2O$.	$CaCO_3$.			
1	15	100	17½	195	213·28	62°
2	50	100	100	198	216·56	62°
3	75	100	300	195	213·28	62°
4	90	100	900	195	213·28	62°
5	Obtained by filtering from No. 1. and 2.			188	205·62	62°
6	Sample taken from lime in use one or two years; at least the former.			182	199·06.	61°

These results would appear to show—

1st. That Mr. Maben's figures, taken without qualification, are not correct, and

2nd. That the Pharmacopœia standard is a fair one.

As to the first conclusion, I would not, for a moment, deny the possibility, or even probability, of calcium hydrate being so kept (especially if in coarse powder) as to become so covered upon the surface with carbonate, or converted perhaps into the hydro-carbonate, as to yield little to water. Mr. Maben does not, however, state that his hydrate had become deteriorated in this way, and we are, therefore, left to assume that he expected to get an equally saturated solution, either with an insufficient quantity of hydrate or that he did not allow sufficient time.

With regard to the second conclusion, I may say that the lime water drawn off with a pipette, although it had been allowed to stand for double the time directed by the Pharmacopœia, was not bright, and I impute the difference between No. 5 and those above (especially No. 2) to the presence of suspended matter. Even, however, with this deduction the figures would appear, at first sight, to confirm the B.P. standard, but I believe they do no such thing, except in so far as an impure lime water is concerned. I have before found that lime water from fresh lime was stronger than that made from well washed lime, and I have no doubt that this is due to the presence of hydrate of potash or soda formed during the burning of the lime from the sulphates or chlorides of these bases no doubt present.

Mr. Maben's method of filtration at different temperatures is not unexceptionable and a consideration of the difference in the parts of water required at temperatures differing by 5° C. will, I think, show that there is some discrepancy; commencing with the difference between 0°—5° they are as follow:—5, 6, 9, 12, 40, 31, 47, 23, 53, 34, 85, 32, 72, 27, 78, 49, 26, 191, 71, 0. These figures would produce a very erratic curve of solubility.

I see no reason to prefer the decinormal nitric acid to the half strength oxalic acid, the precipitate found by the latter rather increasing than diminishing the facility of use. Moreover to standardize the former is a troublesome

operation. I trust that Mr. Maben will not suppose that I underrate the value of his paper, on the contrary, the interest which it conveyed prompted me to repeat, perhaps in a different form, the experiments which he mentions. The fact that he practically confirms Dalton's solubility, 1 in 778 (at 60° F. not 15° C.), confirms my results, and the fact that the sample (6) in the above table was taken from lime from which probably quite 100 gallons of lime water had been made shows that such an arrangement as I described in November, 1882, admirably answers its purpose.

My original statement that "at 70° the solubility is reduced not far from 10 per cent." was, no doubt, putting the difference rather high, although I consider that a standard 10 per cent. below the Pharmacopœia is not too low to adapt as a minimum.

In conclusion, sir, I would beg to point out that I did not, as would be inferred from your retrospective remarks upon the year 1883, suppose that temperature was the cause of the deficiencies in the strength of lime water for which prosecutions had been instituted.

Nor do I think that Mr. Maben would say that the temperature of a shop rarely rises above the point at which the official strength of lime water can be maintained, for his own figures show that at 86° F. (30° C.) the strength would be only ·51 grs. in the ounce.

From my own experiments I should be inclined to think that the presence of magnesium or silicate of calcium in commercial lime (which is indicated by the Pharmacopœia description) is the greatest source of the deficiencies which have been shown in Court.

Liverpool. A. C. Abraham.

Influence of the Electric Light on Plants.

Sir,—More than a year ago, on observing in several newspapers and journals notices relating to the growth of wheat by means of the electric light (also lately alluded to), I resolved to make some investigation into the matter, as I doubted the statements which had been recorded on the subject.

Our first experiment was made with some good sized potatoes. A few of these were placed in a position where they were exposed to the full glare of an electric light during the whole of the night, though in the daytime the place which they occupied was kept quite dark. The remaining portion of the potatoes was laid down in a continually dark place, but enjoying a similar amount of space for air circulation and exactly the same temperature as those on which the electric light flared.

When the potatoes had pushed growths about 5 inches in length they were removed and examined in broad daylight. The growths of both lots equal in length bore the same general appearance, and completely resembled the growths of potatoes which had lain for some time in a dark cellar or in the bottom of a stowed-away barrel.

I examined with great care those which had vegetated under the influence of the electric light to see if the growths possessed any green colouring matter (chlorophyll). But not the faintest stain or tinge of this could be seen, so that the great principle which either directly or indirectly builds up, nourishes and develops all the higher forms of plants and trees and ripens and colours fruits and seed pods was found to be absent. Chemists may analyse and identify the electric light with the rays of the sun in whatever way they please, but it is quite evident that the latter is something altogether different. I venture to assert that the electric light, even if perfected to a far higher degree than it at present is, will not be found to influence in the most remote way the development of even any of the lowest forms of vegetation. The opinion, therefore, which has been expressed of its value in accelerating and assisting the growth of plants and ripening of fruits is simply a delusion.

Anyone can satisfy himself of the matter by making a trial such as I have described. Large rapid growing seeds planted in loam and watered will answer the purpose just as well as potatoes, only that the latter can be laid about anywhere and demand no special attention.

Cramond Village, by Edinburgh. Robert Cross.

Patent Medicines containing Poison.

Sir,—When one remembers how numerous have been the letters which have appeared upon this matter in your Journal during the past two or three years from correspondents in all parts of the country, and the frequent articles which you have devoted to the same subject, together with many discussions upon certain clauses of a proposed amendment to the Pharmacy Act, in which an important alteration is proposed in the sale of all patent medicines containing scheduled poisons, and in the matter of defining a responsibility with regard to such sale, it may perhaps be excusable to remind Dr. Connell that with such evidence before him it will be impossible to charge the pharmaceutical body with any want of interest in this direction or with any laxity in their determination to effect a revolution if possible.

Dispensing chemists generally will be only too ready to co-operate with the medical profession in the endeavour to carry out any reform which would operate for the public good; and Dr. Connell may feel perfectly assured that there is no class of men more earnestly desirous of an expurgation of this and other flagrant abuses than pharmacists, and not one which suffers so much from the uncertainty of being responsible for that to which no legal responsibility is accorded,

Although it still remains possible for "grocers, oilmen and others to sell medicines of which they know absolutely nothing," it has always been a serious question to me as to how far a qualified chemist is justified in sheltering himself behind the patent medicine exemption clause of the Pharmacy Act, for whilst through ignorance the grocer or the oilman has absolutely no responsibility, the chemist has morally, at the present moment, as much as he will ever have, except that it remains legally undefined. If therefore, the chemist should persist in retailing particular medicines (so-called patent) which have in his experience supplied the occasion for a coroner's inquiry, without a printed caution as to the uncertain nature of the compound, it appears to me that he accepts unreservedly the possibilities of a humiliating interrogatory, from the results of which no patent medicine clauses could shield him.

Kilburn, N.W. Charles B. Allen.

The late Dr. Carruthers.

Sir,—There are probably many in this neighbourhood, who, like myself, have vainly looked for some obituary notice of the death of poor Dr. Carruthers. But I suppose that beyond his immediate neighbourhood the highly interesting facts of his career in pharmacy, as well as the extraordinary circumstances in relation to his fatal accident, have not penetrated. From an obscure market town in Cumberland, where he had creditably served the usual term of apprenticeship, he came up to London, and duly passed the Minor examination about ten years ago. Then advancing still he received another well deserved honour in the shape of the membership of the Royal College of Surgeons.

It should be remembered, however, that for a time he was in business as a chemist and druggist, at Moss Side, Manchester, whence he succeeded in qualifying himself for the medical profession. And just when he was entering the threshold of an apparently prosperous career, and whilst administering professional assistance to some of the sufferers during the late great storm, a further downfall of chimneys took place, when he was struck down with injuries which resulted fatally after a brief period. His friends here are practically carrying out their appreciation of his heroic and Christian career by raising a fund for the benefit of his young wife and family, and they hope to realize, at least, £2000.

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Xenophon.—Glycerine is a very good excipient for pepsine pills. See Dispensing Memorandum, No. 438 (*Pharm. Journ.* [3], xi., 167, 253).

W. Fingland.—Dr. MacAlister delivered his lecture at the London Institution, not at the Royal Institution. We are not aware that it has been published.

Communications, Letters, etc., have been received from Messrs. Liversege, Hesse, Robinson, Student, Alpha, Maryland.

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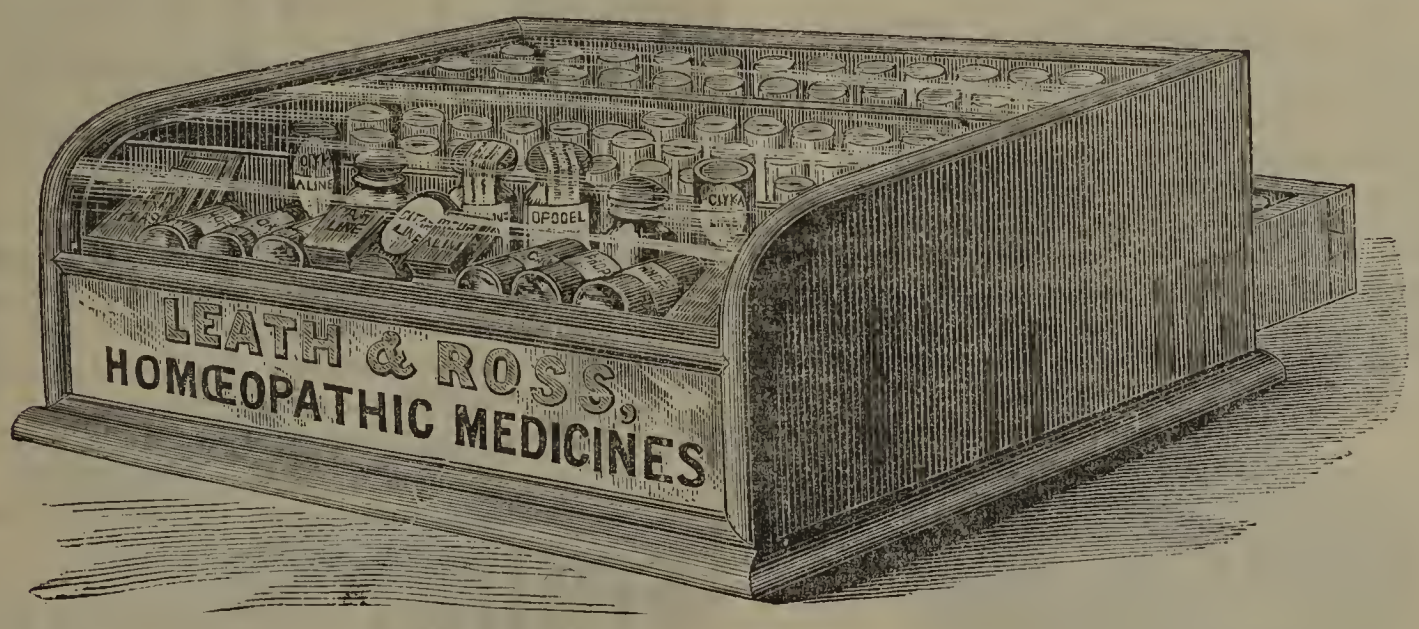

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„ W. T. Sergent.....Croydon.

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*Mr. G. H. Bradford.....Bradford.
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* „ H. R. Dorning.....Chorley.
* „ E. H. Taylor.....Tonbridge.
* „ Richard Brown.....Rochester.
* „ Walter Jackson.....Catterick.
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„ „ Foster	„ J. H. Shacklock
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FOURTEENTH SESSION, 1883-4.

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do. Stone..) terms	50	50					50	50	6/–	5/–	22/–	17/6
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Birmenstorf	50		11/–		41/–		50		12/–		44/–	
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Bussang	50		6/6		24/–		50		7/–		28/–	
Carlsbad	50		8/6		33/–		50		9/6		38/6	
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Contrexeville	50		8/6		33/–		50		10/–		36/–	
Ems	50		7/–		27/6		50		8/–		30/–	
Evian	60		11/–		54/–		60		12/–		44/–	
Friederichshall	30	60	10/6	8/6	25/–	35/6	30		12/–	8/6	28/6	40/–
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Pullna	40	40	10/6	7/6	32/–	22/–	40	40	12/–	8/6	36/–	25/–
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Wildungen	50		10/–		42/–		50		11/–		43/–	
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The
Pharmaceutical Journal
AND
Transactions.

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17, BLOOMSBURY SQUARE, LONDON.

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With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on February 6th should be forwarded to the Secretary not later than Wednesday, the 30th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

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FOR 1884.

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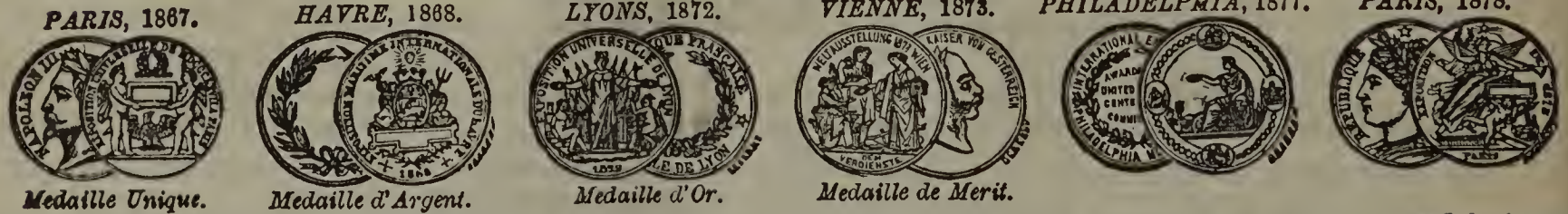

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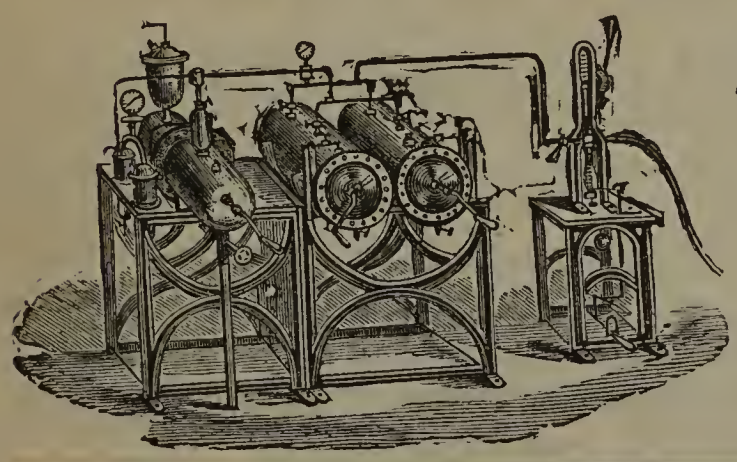

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THE SALTS OF NARCOTINE.*

BY DAVID BROWN DOTT, F.R.S.E.,

Pharmaceutical Chemist.

The subject I have chosen for discussion in this short paper has not, at first sight, a very obvious interest for pharmacists, but, I think, further consideration will show that it has a bearing on pharmacy in two ways. These are, firstly, the importance of narcotine on account of its presence in nearly all the Pharmacopœia preparations of opium; and, secondly, the possibility of its salts passing into therapeutical use.

No one can have studied, ever so slightly, the literature of opium and its assay, and have failed to observe how frequently narcotine has been to the chemist a stumbling block and source of trouble. We need not now discuss in what various ways this has arisen. Although it is now many years since Regnault and Robiquet prepared and analysed the muriate of narcotine, there is still a prevalent idea that narcotine is not an alkaloid at all, or, at any rate, that it does not form well-defined salts. In support of this statement it would be easy to select suitable quotations from several writers, but I shall take as my text the following from Professor Flückiger: †—"The narcotine is present chiefly in the free state, as it is not really an alkaloid; it is, therefore, not, or not entirely, removed by water. With acetic acid, as well as with other acids, narcotine forms not well-defined salts; the acids are simply solvents from which it again separates as soon as the acid is neutralized." This is for the most part erroneous, as we shall very soon see. Let us first consider the various salts and their properties, so far as our knowledge goes.

Meconate.—This salt first engages our attention, as it is almost certainly the form in which narcotine exists naturally in opium. When narcotine and meconic acid are dissolved together in water, in molecular proportions, *i.e.*, two molecules of the base to one of the acid (which is di-basic), a syrupy solution is obtained which refuses to yield crystals. If evaporated, the salt dries as a varnish. Unlike most amorphous salts this is not readily taken up by water. When the proportions for the acid meconate are used, a clear viscous solution is obtained. This ultimately becomes filled with crystals, but I have not yet ascertained whether they are really a crystalline acid salt, or only the neutral salt with separated acid. "The books" give no information about these meconates.

Acetate.—This is one of the only two crystalline salts mentioned by the older authorities. According to Berzelius, it is prepared by "dissolving narcotine in concentrated acetic acid, and evaporating *in vacuo* in presence of lime." We prepared a quantity of acetate according to these directions (leaving out the lime). Narcotine will not dissolve in an equivalent of glacial acid; indeed, a clear solution was only obtained by warming with several times that amount. On cooling, the solution before long became filled with crystals, which were strongly pressed, first in calico and then between blotting paper. The crystals were immediately bottled, and two portions weighed off as quickly as possible. One of these was mixed with ten times its weight of calcic hydroxide, and exposed in the water-bath, while in the other the narcotine was determined by precipitation with ammonia.

23·04 grs. lost in w.-b. 0·36 gr. = 1·56 per cent.

26·45 grs. treated with cold water left undissolved 24·28 grs. By NH_3 0·66 gr. was obtained in addition, making the total narcotine = 94·29 per cent.

		Calculated.	Found.
$(C_{22}H_{23}NO_7)_3.C_2H_4O_3.H_2O$	+ N	94·07	94·29
	H_2O	1·36	1·56

Whence it is probable that the salt obtained as just described has the above composition. In any case, it is of no value on account of its insolubility in water, or (what amounts practically to the same thing) its immediate decomposition by water.

Hydrochloride.—The dry salt was correctly described by Regnault and by Robiquet, but they make no mention of water of crystallization. Dr. Wright was the first who fully investigated this salt, and our analysis leads to the same conclusion, that the normal hydrochloride has the composition $C_{22}H_{23}NO_7.HCl.H_2O$. Strong solutions of this salt show a curious tendency to gelatinize, like the salts of cryptopia. The muriate of narcotine may be regarded as its most important salt, being easily prepared and fully soluble.

Sulphate.—I have not been able to find any published reference to this salt, which is readily obtained by dissolving narcotine with the theoretical proportion of sulphuric acid and allowing to crystallize. Some of these crystals were dried by exposure to the air, and a weighed quantity of the air-dry salt placed in the water-bath.

14·55 grs. lost 0·10 gr. = 0·68 per cent.

Two portions of same salt dissolved in water, excess of ammonia added, and the precipitates collected and weighed.

17·200 grs. gave 14·30 grs. = 83·13 per cent.

6·555 grs. gave 5·45 grs. = 83·14 per cent.

14·55 grs. dried at 130° C. gave only 78·35 per cent., indicating decomposition at that temperature.

The salt dried in water-bath lost weight further in the air-bath at 120°. 9·74 grs. lost 0·675 gr. = a loss in weight of 6·93 per cent. on the air-dry salt.

From the results obtained it was suspected that the sulphate used in these experiments had been over dried by too long exposure to the air. A quantity of it was therefore moistened with water, and when apparently just dry was transferred to the water-bath.

9·740 grs. lost 1·48 grs. = 1·48 per cent.

It would, therefore, appear that narcotine sulphate has the composition $(C_{22}H_{23}NO_7)_2.H_2SO_4.4H_2O$, and that it loses one molecule of its water below 100° C., the remainder at a higher temperature.

		Calculated.	Found.
+ $N_2H_2SO_4.4H_2O$	H_2O	7·22	6·93
+ $N_2H_2SO_43H_2O.H_2O$	H_2O	1·71	1·48
"	+ N	82·93	83·13

We have not prepared any other salts besides these, and it is indeed unnecessary to do so. The meconate, muriate and sulphate dissolve completely in water, and their solutions remain clear even when largely diluted. Not so the acetate. By adding hot water to a solution of narcotine in dilute acetic acid, the greater part of the alkaloid is precipitated. One thing is noticeable regarding all salts of narcotine, that their solutions are *acid*, *i.e.*, they behave

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, January 16, 1884.

† 'Year-Book of Pharmacy,' 1879, 543.

as if they contained free acid. This I have no doubt they do, in common probably with all acid solutions of salts. When such a solution is shaken up with a solvent capable of dissolving the base, some of the base is taken up; as when a solution of narcotine muriate is agitated with ether. The process may perhaps be expressed in this way:—Narcotine, hydrochloric acid, and water have each an affinity or attraction for the others. When narcotine muriate is dissolved in water, the latter attracts the acid so as to cause a certain amount of decomposition in the salt, the affinity between the base and acid not being strong enough to resist the action of the water. Yet this affinity is sufficient to prevent any great decomposition, such as we have in the case of the acetate, where the addition of water causes an almost complete precipitation of the alkaloid. A kind of equilibrium is established, depending, no doubt, on the relative masses of the different components. When a portion of one of these is removed, as narcotine by benzine, the equilibrium is disturbed and rights itself by a little more decomposition, and so on. But it is not necessary to have the salt in solution in order to remove the base by an appropriate solvent. So weak an alkaloid is narcotine that its salts are decomposed, to some extent, by such compounds as ether and "benzine," so that by simply rubbing up the dry salts with one of these solvents, an amount of the alkaloid is dissolved out. Having regard to all these facts, and to what is known otherwise of narcotine and of opium, we are led to the conclusion that narcotine is undoubtedly an alkaloid, that it readily forms salts, and that it exists in opium as meconate (at least for the most part). It is no uncommon occurrence for alkaloidal salts to crystallize with varying proportions of combined water according to circumstances. I have observed this in the case of narcotine hydrochloride, one sample giving numbers indicating three molecules of water. According to Beckett and Wright, the hydrochloride of narcotine forms a series of basic salts by successive crystallizations from hot water. Their experiments I have not repeated, but the muriate certainly stands one recrystallization without decomposition.

Gmelin* states, on the authority of Bouchardat, that the molecular rotatory power of narcotine is $-130{\cdot}6°$ or $-151{\cdot}4°$ for the red ray, but that it is not ascertainable with exactness on account of the slight solubility of the alkaloid in alcohol and ether. "On addition of acids it acquires a rotatory power towards the right, the original rotatory power being brought back by neutralization with ammonia." The rotatory power of acid solutions of narcotine was found by Bouchardat to vary according to the quantity and nature of the acid. More recently Hesse has determined the specific rotatory power of narcotine with the following results†:—

		Alcohol.	Chloroform and alcohol.	Chloroform.
C	=	0·74	2	2 and 5
$[\alpha]_D$	=	−185·0	−191·5	−207·3

It may be thought that these numbers do not agree very well, but it is now understood that the "specific rotatory power" may vary according to the nature and proportion of the solvent used; even although that solvent has no action by itself on polarized light. All that we obtain in such cases is an apparent rotatory power which may differ widely from that of the pure substance. It is, therefore, necessary to state the solvent and the percentage of substance dissolved therein, as the angle of rotation does not vary directly as the amount of substance, when the latter is in solution.

Before knowing of Hesse's work on the subject, I determined the specific rotatory power of narcotine dissolved in "benzine," the solution containing 1·59 per cent. My friend Mr. W. Peddie, Assistant to the Professor of Natural Philosophy in the University, kindly made a duplicate determination for me, he using a Duboscq's polariscope with compensator, and I using a Jellet. Our results are practically identical and give the value $[\alpha]_D = -229°$. It was, of course, ascertained in the first place that the benzine did not affect appreciably the polarized light. I can confirm Bouchardat's observation that acids change the polarization from left to right, a solution of narcotine in dilute oxalic acid giving $[\alpha]_D = +62$.

* 'Handbook,' xvi., 137.

† Watts' 'Dict.,' viii., 1223.

PREPARATION OF GALAZYME OR ARTIFICIAL KOUMISS.*

BY ADAM GIBSON.

Much has been written regarding this medico-dietetic preparation, and having personally had some experience in the manufacture of it during the past few years, I have had opportunity of testing the various methods which have been proposed for its production.

It may be explained at the outset that the koumiss of the Tartars is prepared from mare's milk, fermentation being set up at the beginning of the season with kefir (dried koumiss of the preceding year), and, subsequently, its manufacture is effected with koumiss of a previous operation, fermentation being in all cases accelerated by agitation in a sheepskin bag.

It is unnecessary to notice here the physiological effects of the preparation, it being sufficient to state that medical practitioners have found it a valuable aid in the treatment of many wasting diseases.

The difficulty of obtaining mare's milk in this and other countries has led to experiments with other milks, and it has been found that cow's milk with some little adaptation sufficiently meets the requirements of the case. Koumiss prepared from this source has been termed "galazyme."

Various processes have been proposed, and the following classification contains the principal of them:—

1. Fresh cow's milk, containing added cane sugar, fermented with yeast or old koumiss.
2. Skimmed cow's milk, containing added cane sugar, fermented with yeast or old koumiss.
3. Skimmed and fresh cow's milk, containing added cane and milk sugars, fermented with yeast or old koumiss.

Before stating the results of my experience of these general methods, I may state that the objects aimed at are (1) formation of alcohol, carbonic and lactic acids, and (2) a preparation of homogeneous consistency.

In the first method, vinous fermentation proceeds so rapidly, with formation of acetic acid and subsequent curdling of the caseine, that the product is practically useless. Butyric fermentation also sets in after a few days, the accompanying odour entirely precluding the use of the preparation, this being due

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, January 16, 1884.

to the large amount of fat present in the fresh cow's milk.

In the second method the same objectionable curdling of caseine takes place and alcohol is produced in too large a quantity (I have found as much as 3 per cent., on the twelfth day). The product remains, no doubt, longer free from curd and there is less tendency to butyric fermentation, but on the whole the method does not give satisfactory results.

It would, therefore, appear that the use of fresh cow's milk fails to yield a satisfactory preparation, and that the use of cane sugar alone tends to defeat the objects in view. Coagulation or curdling of the caseine is certainly the principal difficulty to overcome, and to obviate this, it has been proposed to churn the mixture at hourly intervals for ten or fifteen minutes at a time during the course of twenty-four hours before bottling. It is claimed for this method that minute division of the caseine is assured. I have found that it certainly accomplishes this object, but the product is butter-milk and not galazyme, owing to the destruction of the ferment by long churning, so that the adoption of the long-continued agitation-process cannot be considered at all suitable.

The plan which I have found most practicable is to use skimmed milk, starting the fermentation with a small proportion of cane sugar, and subsequently adding a larger proportion of milk sugar according to the details which I give further on. Skimmed milk may appear to be objectionable on account of its poorer quality, but the following analysis by Hartier of mare's milk compared with an average analysis of cow's milk shows that the latter contains more caseine and fat, and less sugar than the former.

	Mare's milk.	Cow's milk.
Caseine and nitrogenous substances	1·4 per cent.	4·3 per cent.
Fat	2·1 per cent.	3·8 per cent.
Lactose	7·3 per cent.	4·5 per cent.

In using skimmed cow's milk we get rid of a quantity of fatty matter which tends under certain circumstances to favour butyric fermentation; by diluting with water we may reduce the proportion of caseine, and by adding sugar we increase the saccharine constituent, thus bringing the composition of the fluid to nearly that of mare's milk. The fatty constituent in the product is undoubtedly in less proportion than in koumiss;* but it is believed by authorities that this is not an objectionable feature, and, as will afterwards be shown, the product prepared as I propose compares very favourably with galazyme supplied to pharmacists in this country.

Formula and method of procedure :—

Take of—

Skimmed cow's milk	150 ounces.
Water	50 „
Brewer's yeast	1 ounce.
Cane sugar	3 ounces.
Milk sugar	5 „

Dissolve the cane sugar in 20 ounces of water, mix it with 75 ounces of the milk, and add the yeast; the mixture is now to be well stirred and set aside in a warm place (temperature 75° to 80 F.) for nearly six hours or until small bubbles appear on the surface of the liquid; the remaining 75 ounces of milk along with the 30 ounces of water (in which the milk sugar has been dissolved) should now be added to the fermenting milk and the whole thoroughly mixed up, strained and bottled, the corks being well tied down. It should then be kept at a temperature below 55° F. if not required for early use, or if so required it may be ripened in two or three days by keeping it at 70° F.

This method yields a preparation of a perfectly homogeneous consistency, having a sweet and acidulous taste up till the fifteenth day, after which it acquires to a slight degree the taste of butter-milk, which flavour gradually increases as it grows older. It also begins to thicken after the fifteenth day, but even at the thirtieth day the caseine remains finely divided after shaking.

It seemed to me to be of some importance to determine the composition of the galazyme so prepared, before contributing this communication, and several analyses were accordingly made at different stages.

A quantity was prepared on November 10, 1883, and a number of bottles each containing 250 c.c. were reserved for analysis.

In determining the percentage of the constituents the following methods were adopted.

For Alcohol.—250 c.c. of galazyme were submitted to distillation. The first 100 c.c. which distilled were found to contain all the alcohol present, and this quantity was diluted with distilled water to 250 c.c. and the percentage of alcohol calculated from its specific gravity.

Total solids and other milk constituents were determined by Wanklyn's methods, briefly given as follows:—

Total Solids.—5·430 grams contained in a platinum dish were evaporated to dryness on a water-bath (time taken three hours), then cooled and weighed.

For Ash.—The total solids were simply ignited, cooled and weighed.

For Fat, Caseine, Lactose and Lactic Acid.—13·181 grams were evaporated on a water-bath (time taken one hour), and the residue obtained moistened with a little alcohol, then boiled with successive portions of ether; the washings filtered, evaporated and weighed, indicated the fat present.

For Caseine.—The residue from the fat determination was digested and repeatedly washed with alcohol, then with alcohol to which a few drops of boiling water had been added, the whole being thrown on a filter and further washed with alcohol; the residue being dried as usual and weighed, it was ignited, cooled and weighed, and the ash subtracted from the amount of caseine found.

For Lactose and Lactic Acid.—The washings from the caseine residue were evaporated to dryness, ignited and weighed as in caseine, lactic acid being separately determined with normal sodium carbonate solution, 100 c.c. of galazyme being used for this purpose.

In determining carbonic acid, the gas from 250 c.c was passed into ammonia solution, which was then treated with calcium chloride solution and boiled, the precipitated calcium carbonate collected on a paper filter and carefully washed with boiling water. The filter and precipitate were afterwards trans

* According to Hartier, koumiss (*i.e.*, from mare's milk) has the following composition:—

Alcohol	1·65 per cent.
Fat	2·05 „
Milk sugar	2·20 „
Lactic acid	1·15 „
Caseine and albumen	1·12 „
Ash or salts	0·28 „
Carbonic acid	0·785 „

erred to a beaker and treated with a known volume of normal nitric acid, excess of the latter being finally determined with normal sodium carbonate solution. The amount of calcium carbonate found indicated carbonic acid present.

The following table indicates results of analyses according to these methods, and specific gravities at the different stages. It may be noted that the specific gravity at the time of bottling was 1·040 at 60° F.

Table showing Composition of Galazyme on November 14, 18 and 22

Constituents.	4th day, sp. gr. 1·0386.	8th day, sp. gr. 1·0382.	12th day, sp. gr. 1·038.
Water	88·66	88·52	88·36
Alcohol	0·60	0·80	1·00
Carbonic acid . .	0·44	0·52	0·59
Total solids . .	10·30	10·16	10·05
	100·00	100·00	100·00
Solids consisting of—			
Lactose . .	6·185	5·974	5·688
Lactic acid .	0·225	0·360	0·540
Caseine . .	2·693	2·670	2·655
Fat	0·455	0·447	0·440
Ash	0·552	0·534	0·521
Loss. . . .	0·190	0·175	0·206
	10·300	10·160	10·050

In comparison with these results, I may quote the following analysis by Wanklyn of full koumiss, forty-eight hours old, prepared in London:—

Sp. gr. 1·032 at 67°F.		Total Solids contained.	
Water	87·32	Caseine	2·84
Alcohol	1·00	Lactose and lactic acid	6·60
Carbonic acid . .	0·90	Fat	0·68
Solids	10·78	Ash	0·66
	100·00		10·78

It would appear from this comparison that the variation is no greater than we would expect to find in working with different samples of milk.

In entering so much into detail, my intention has been to show that a good artificial koumiss, equal to that found in the market, can be prepared in the pharmacist's own laboratory; and knowing the difficulty which the provincial pharmacist has in supplying a rather erratic demand for the article, I believe it is as well that we should be able to make a supply when a medical practitioner indicates his intention of using it in his practice.

[*The discussion on this paper is printed at p.* 593.]

SOME AFRICAN KOLAS,

In their Botanical, Chemical and Therapeutical Aspects.*

BY E. HECKEL AND F. SCHLAGDENHAUFFEN.

Among the vegetable products of the African soil, there is perhaps none more interesting and valuable than those which under the various names of "kola," "gourou," "ombéné," "nangoué," and "kokkorokou," are used as articles of consumption throughout tropical and equatorial Africa, as equivalent to tea, coffee, maté and cocoa. Used under the form of seeds, probably from time immemorial, by the native tribes, these products are of varying botanic origin, and their history has been up to the present time imperfectly known; but the authors have been able to avail themselves of the observations of some recent travellers to clear up some obscure points.

The products which are included by the authors under the name "kola" (the various synonyms quoted being special to particular countries) consist of seeds, yielded by two families of plants and differing very much in appearance. The kind most widely distributed, the "true kola," which by some of the natives is called the "female kola," comes from the Sterculiaceæ; another variety, called by the author "false kola," is known among the negroes as simply "kola," or "male kola." Before the authors' researches only the "true" or "female" kola was known, and it had been ascertained to be yielded by the *Sterculia acuminata*, P. de Beauv. (*Cola acuminata*, R. Br.). To this Messrs. Heckel and Schlagdenhauffen are able now to add information concerning the "male" kola, hitherto unknown, and to give reasons for believing that various other species of *Sterculia*, besides *S. acuminata*, yield kola seeds.

Dealing first with "female" kola, the authors describe at length *Sterculia acuminata* from specimens, the description agreeing with Oliver's description of var. *a* (Fl. Trop. Af., i., 220). According to the best information, the tree—which is from 30 to 60 feet high, and in general aspect resembles the chestnut—grows wild upon the western coast of Africa comprised between Sierra Leone and the Congo or Lower Guinea, reaching into the interior about five or six hundred miles, where it appears to follow the limits of the palm. Upon the eastern coast it appears to be unknown in places where it has not been introduced by the English. Dr. Schweinfurth, speaking of the country of the Nyams-Nyams, near lake Nyanza, says that among the imposing forms of vegetation a *Sterculia* of the kola kind predominates and is called locally "kokkorokou." In the country of the Momboutous (24° E. long., 3° N. lat.), too, upon asking for kola he was supplied with the fruit in its rose-coloured envelope; but the only information he could obtain there concerning it was that the nuts were found in the country in the wild state and were called "nangoué" by the natives, who chewed slices of it whilst smoking. Karsten, in his 'Flore de Colombie,' describes the plant as growing wild in the moist hot woods near the southern coast of Venezuela, but the authors believe it was probably introduced there about the same time as it was introduced into Martinique, and that it was sown by African negroes, who brought it into those countries in the same manner as they are known to have introduced *S. cordifolia* for the sake of its delicious fruit. It has also been introduced successfully by the English into the East Indies, the Seychelles, Ceylon, Demerara, Dominica, Mauritius, Sydney and Zanzibar, and by the French recently at Guadeloupe, Cayenne, Cochin China and the Gaboon. In all these stations the kola tree flourishes best in moist lands at the sea-level, or a little above. At Sierra Leone some fine trees are found at an elevation of 200 or 300 metres, but not higher than that.

The kola tree commences to yield a crop about its fourth or fifth year, but it is not until about its tenth year that it is in full bearing. A single tree will then yield an average of 120 lbs. of seed annually. The flowering is nearly continuous after the tree reaches maturity, so that a large tree bears flowers and fruit at the same time. There are two collections; the June flowering yielding the fruit in October and November and that of November and December in May and June. When the fruit is ripe it takes a browish yellow colour. In this condition dehiscence of the capsule commences along the ventral suture, exposing red and white seeds in the same shell. It is at this period that they are gathered. It has been stated that there exist two varieties of kola, one yielding exclusively red seeds and

* Abstract of a lengthy memoir read before the Union Scientifique des Pharmaciens de France (*Journ. Pharm. et de Chimie*, [5], vii., p. 553; viii., 81, 177.

the other white; but the authors have been repeatedly assured that this is not the case, and that one and the same capsule may contain fifteen seeds varying considerably in size, white and red together, without the white being considered less ripe than the red. The carpels are from 6 to 9 centimetres long and 3 to 5 thick and the spongy pericarp is about 2 or 3 millimetres thick. As many as five or six ripe carpels may result from a single flower, and these may each contain from five to fifteen seeds; but sometimes carpels are met with containing only a single seed. The seeds removed from their envelope weigh, according to their development, from 5 to 25 or 28 grams. The epiderm is the principal site of the colouring matter, and beneath it the cotyledonary tissue consists of a mass of cells gorged with large starch granules comparable to potato starch. It is in these that the alkaloids caffeine and theobromine are found in the free state.

The collection is conducted with great care and is made by women. The seeds are removed from the husk and freed from the episperm. In order to maintain their value among the negroes it is necessary to keep them in a fit state and in good condition. They are, therefore, carefully picked over, all damaged and worm-eaten seeds being removed, and the sound seeds are then placed in large baskets, made of bark and lined with "bal" leaves (*Sterculia acuminata*, Car., or *S. heterophylla*, Beauv.?); the seeds are heaped up and then covered over with more "bal" leaves which, by their thickness, resistance and dimensions, contribute not a little to the preservation of the seeds by keeping them from contact with dry air. Packed in this manner the seeds can be transported considerable distances, remaining free from mould for about a month, during which time it is not necessary to submit them to any treatment in order to preserve them fresh beyond keeping the "bal" leaves moist. But if it be desired to keep them beyond that time the operations of picking and re-packing have to be repeated about every thirty days; the seeds being washed in fresh water and fresh "bal" leaves placed in the baskets. The baskets usually contain about 3 cwts. of seeds. It is in this condition that "kola" is sent into Gambia and Gorce, where the principal dealings in the seeds are carried on. In Gambia they are sold in the fresh state to merchants travelling with caravans into the interior, who dry them in the sun and reduce them to a fine powder, which is used, mixed with milk and honey, by the tribes of the interior to make a very agreeable, stimulating and nourishing beverage. It most frequently arrives at Sokota and Kouka in the Soudan and Timbuctoo, where large sales of the seeds are made, in the fresh condition; from the Soudan markets it is carried by caravans to Tripoli, and from Timbuctoo into Morocco. As might be expected the value of the kola increases as it makes its way into the interior of Africa, and the authors state that some of the tribes furthest removed from the sea pay for the dry powder with an equal weight of gold dust. Kola plays an important part in the social life of many of the African tribes, and the authors mention some of the occasions upon which it is used in terms almost identical with those in a paper read at an evening meeting of the Pharmaceutical Society eighteen years ago (*Pharm. Journ.*, [2], vi., 450). An interchange of white kola between two chiefs is indicative of friendship and peace, whilst the sending of red kola is an act of defiance. An offer of marriage is accompanied by a present of white kola for the mother of the lady; the return of white kola is equivalent to acceptance of the suit, whilst red means rejection. The absence of a supply of kola from among the marriage presents would endanger the whole arrangement. All the oaths are administered in the presence of kola seeds; the negro stretches out his hand over them whilst he swears and eats them afterwards.

Fresh kola is used as a masticatory, as is also the dried powder, by the tribes in the interior. When fresh the taste of the seeds is first sweet, then astringent and finally bitter. When the seeds become dry the bitterness diminishes, giving place to a sweeter flavour; but upon steeping them in water for a couple of days the original bitterness is nearly restored. Preference is given for mastication to seeds containing only two cotyledonary segments, it being asserted that they are less rough than those with four to six segments; but the authors did not find anything in their chemical examination to explain this preference. The practice of kola mastication, which is always accompanied by the swallowing of the saliva, does not injuriously affect the teeth, as is the case with the betel nut, but tends to render the gums firm and exercises a tonic influence on the digestive organs. The seeds are reputed to clarify and render healthy the most foul waters, and to render tainted meat edible, and when chewed, either fresh or as a dry powder, and the saliva swallowed, to be a sure preventive against dysentery. They are also said, like *Erythroxylon Coca*, to possess the physiological property of enabling persons eating them to undergo prolonged exertion without fatigue, which is probably to be attributed to the caffeine they contain. Further it is said that kola exercises a favourable influence upon the liver, and that white people, living in those regions, who chew a small quantity before meals escape constitutional changes due to affections of that organ. They are also believed by the negroes to have aphrodisiac properties. With respect to the assertion that the pulp or powder of the seeds thrown into foul water has the property of cleaning it, an experiment made by the authors would appear to show that any action in this direction would be due to the formation of a kind of mucilage, which would act mechanically like the white of egg.

It has been pointed out that the name "kola" is applied in Africa indifferently to several Sterculaceous seeds other than those of the two varieties of *Coca acuminata*, although these are the most valued in the native markets. It is probable that the African plants capable of yielding seeds resembling the true kola are *Cola Duparquetiana*, Baill., *C. ficifolia*, Mast., *C. heterophylla*, Mast., *C. cordifolia*, Cax., and perhaps *Sterculia tomentosa*, Hend. But the authors think it doubtful whether these seeds contain caffeine, otherwise they would be as much sought after as the true kola.

In order to determine chemically the composition of kola seeds, the authors made a large number of experiments; the details fill many pages in the original paper. The dry seeds were first operated upon, and the process which appeared to give the best results was to exhaust the dried powder successively with chloroform and alcohol. The chloroform percolate was a yellowish liquid; this was evaporated to dryness, and the residue treated with water, which separated a fatty substance with an odour recalling that of cacao butter and entirely saponifiable by caustic potash. The yellow liquid upon concentration after filtration, deposited silky needles of caffeine, but when the solution was rapidly evaporated and the residue treated with water, ether or chloroform it no longer completely dissolved without using a considerable quantity and boiling, and upon such a solution cooling a small quantity of a compound crystallized out in microscopic prisms and octahedra which proved to be theobromine. The substances separated by chloroform from the dry nuts, were—caffeine, 2·348 per cent.; theobromine, 0·023 per cent.; tannin, 0·027 per cent.; fat, 0·583 per cent.

The kola powder was then dried and exhausted with alcohol. A mahogany coloured extract was obtained which when treated with boiling water dissolved entirely, but the solution on cooling deposited a large quantity of colouring matter. The aqueous solution was precipitated with triplumbic acetate, the precipitate decomposed with sulphuretted hydrogen, and a liquid obtained, free from bitterness, containing a considerable quantity of a tannin giving an intense green colour with persalts of iron, and a

soluble colouring matter that formed lakes in contact with metallic solutions; the residue of the aqueous solution, after removal of excess of lead, was found to contain only glucose and a small quantity of fixed salts. The colouring matter deposited upon the cooling of the boiling water used in dissolving the alcoholic extract differed in its nature from the soluble colouring matter. It appeared to be an oxidation product from the tannin and presented considerable analogy to cinchona red; in order to distinguish it, therefore, the authors have named it "kola red."

The composition of the alcoholic extract from the dry nuts (5·826 per cent.) was found to be—tannin, 1·591 per cent.; kola red, 1·290 per cent.; glucose, 2·875 per cent.; fixed salts 0·070 per cent.

The entire composition of the kola nut is compared by the authors with that of tea, coffee and cacao as follows:

	Cacao (Mitscherlich).	Coffee (Payen).	Tea (Peligot). Green	Tea (Peligot). Black	Kola (Authors').
Fat	53 00	13·00	0·28	—	0·585
Proteid Matters	13·00	13·00	3·00	2·80	6·761
Theobromine	1·50	—	—	—	0·023
Caffeine	—	2·25	0·43	0·46	2·348
Essential Oil	0·04	0·003	0·79	0·60	undct.
Resin	—	—	2·22	3·64	—
Sugar	0·5	15·50	—	—	2·875
Starch	—				33·754
Gum	—	—	8·58	7·28	3·040
Cellulose	—	24 00	17·08	26·18	29·831
Colouring Matters	—	—	17·24	19·20	2·561
Ditto	5·00*	—	2·22†	1·84†	1·290‡
Extractive	—	—	22·80	19·88	—
Tannin	—	—	17·80	12·88	1·618
Ash	3·60	6·697	5·56	5·24	3·395
Water	6·00	12·00	—	—	11·909
	100·00	100·00	100·00	100·00	100·00

These results, it is pointed out, differ somewhat from those obtained by Attfield (*Pharm. Journ.*, [2], vi., 457), especially in the recognition of the presence of a second alkaloid and of tannin. The proportion of caffeine is higher than that observed in any coffee or, except in rare instances, in tea, and exceeds that of theobromine in cacao. The alkaloid exists in kola, as in tea, uncombined, but in coffee, according to Payen, it is present as chlorogenate of potassium and caffeine. It is worth mentioning that the authors report the presence of a considerable proportion of caffeine and some theobromine in the pericarp, but the material at their disposal was too scanty for an exhaustive investigation in this direction. The leaves, wood and bark were also examined for alkaloid, but gave negative results. As in the case of coffee, kola undergoes a considerable loss of caffeine (three-fourths) during roasting, while the quantity of essential oil present is augmented.

Some experiments have been made with this kind of kola in the treatment of the atonic diarrhœa to which Europeans are frequently liable in tropical countries. The results have been fairly satisfactory, and through the efforts of M. Heckel the medicine has been supplied to some French colonial stations for a systematic trial. The preparations used are an aqueous extract, an alcoholic extract and a wine. The alcoholic extract is made by exhausting fresh kola with 5 parts of 60° alcohol and the wine by macerating the same proportions of kola in a sweet white wine during a fortnight. Neither of these preparations, however, completely exhaust the kola, at last as far as the caffeine is concerned. The preparation of an aqueous extract presents considerable difficulty in consequence of the quantity of starch, which forms an unmanageable magma.

Concerning the "male kola" or "kola bitter," as before stated, nothing definite was known, and as recently as the year 1882 it was referred erroneously to a species of *Sterculia*. In the 'Flora of Tropical Africa' Oliver says: "The kola-bitter of Fernando-Po is the product of trees belonging to the Guttiferæ." The authors were led by this remark to attempt to obtain from various parts of the eastern coast specimens of the plant yielding "kola bitter," and although the flowers did not reach them they received specimens of the branches, leaves and fruits, together with a sufficient quantity of seeds to allow of a complete analysis being made. All the specimens received from various places corresponded in their characters, and showed that the kola bitter is the produce of a single Guttiferous species and not of several. From the material at their disposal the authors refer it to a new species, *Garcinia Kola*, Heckel. The plant is described as a tree of variable aspect, 10 to 20 feet in height, bearing towards the base of the branches large opposite leaves (12 in. long by 7 in. broad), with short petioles, whilst at the extremity of the branches the leaves are much smaller (5 in. by 2 in.). The leaves are oval, slightly dilated at the base, mucronate at the apex, without stipules, full green on the upper surface and greyish underneath. The fruit is a berry the size of an apple, with a rugose epiderm covered entirely with rough hairs. It presents three or four divisions, each containing a large oval cuneiform seed, rounded on the external and angular on the internal face; the seeds are covered with an abundant sourish yellowish pulp, constituting a true arillus. The fruit has at the base the persistent calyx still adherent to the peduncle, and sometimes the persistent corolla, and at the apex the persistent stigma. The plant is reported to occur all along the eastern coast of Africa and of Senegal, intermixed with the *Sterculia acuminata*, flourishing under the same conditions, but less widely distributed. In its known characters the plant would appear to be closely allied with *Garcinia Morella*, which, however, is essentially an Asiatic species. The seeds present one convex and two plane surfaces, the former being towards the circumference of the fruit. They are covered by an apricot-yellow episperm, below which is a large yellowish-white macropodous embryo, devoid of cotyledons, and with numerous depressions on its surface. The tissue is denser and closer than that of true kola and crackles under the teeth; it consists of a compact mass of very homogeneous cellular tissue, interspersed here and there with laticiferous vessels of varying size containing resin, the cells constituting which are filled with starch granules larger than those occurring in true kola.

Upon chewing these seeds a strongly bitter, astringent and yet aromatic taste is perceptible, which is quite different from that of true kola, and approaches in its aromatic flavour that of green coffee; it is this aromatic flavour that is esteemed by the negroes. It is worthy of remark that although the use of these seeds does not produce any notable stimulant effects or ward off fatigue, they are as much sought after and fetch nearly as high a price on the eastern coast as the true kola. In the interior, however, they are unknown. The authors are of opinion that these seeds owe their properties to the resin they contain, which is slightly stimulant. By the negroes they are thought to exercise an aphrodisiac action, which the authors consider doubtful, and as a masticatory, they are said to be a valuable remedy for colds.

An examination of fresh male kola nuts for caffeine gave negative results, the chloroform, ether and alcoholic percolates being all free from alkaloid. Besides colouring matter, tannin and glucose, two resins were separated. One of these was brown, hygrometric and soluble in ether and melted at the temperature of the water-bath; the other was yellowish-white, soluble in ether, alcohol, acetone and acetic acid, insoluble in carbon bisulphide or petroleum spirit, and had a high melting point.

A large proportion of the paper is devoted to a study of the constitution of caffeine and several of its derivatives, in reference to the identification of the alkaloidal substances obtained by the authors from the female kola.

MARSALA WINE.*

The English were the first to establish factories in Sicily for the making of the wine known by the name of Marsala. Wine of that sort was indeed made in the country previously; but it was not appreciated in foreign countries until it began to be prepared by the English, who took care to choose the best grapes for the purpose, which are those known in the country under the names of "cateratti" and "trebbiano," and which grow principally in the districts of Castelvetrano, Campobello, and Mazzara, situated in the south-western part of the island. These qualities of grapes, and more particularly the first mentioned, are rich in saccharine matter, tender-skinned, and juicy.

To secure the choicest fruit the English manufacturers make contracts with growers and advance them money, to be returned in fruit, or must of a superior quality. They reserve to themselves the right of inspecting the vines and seeing that they are properly attended to, and they fix the date of the vintage, which usually takes place in that part of the island towards the latter end of September, never earlier. If the crop is an abundant one the manufacturers willingly accept whatever may have been produced over and above the contracted quantity at the market price. On the other hand, if the crop is a poor one, they do not insist on getting the full amount of fruit they ought to receive, which would force the growers to procure the deficit at ruinous prices from other sources, but they agree to receive their due the following year. As the quality of the crop cannot be ascertained in advance, the growers, having full confidence in the honesty and uprightness of the manufacturers, accept the rates fixed by the latter, and it is in the interest of the manufacturers to act loyally towards the growers. Under no circumstance do the English manufacturers allow bad fruit to be pressed for their use, nor will they accept must that does not contain the required quantity of alcohol-producing matter.

The labours of the vintage having been brought to a close those of the factory begin; that is, the choice and trial of the wine. When the new wine is brought in it is placed in casks of about 12 hectolitres. For the English market Marsala wine requires to be highly alcoholized, so as to be able to stand the voyage and to keep. This is not necessary for the Italian market, hence the necessity of choosing the strong wines for the former. Alcohol is added to wine made for exportation, both after racking and at the time of exportation, increasing its volume by 7 per cent. The strength of the Italian wines is from 16° to 18°, while that for the English market comes to 20° and 22°. The alcohol is produced from the inferior qualities of wine, but latterly, owing to the heavy taxes levied upon spirits manufactured in Italy, other means have been resorted to to replace alcohol or to produce it naturally. With this object in view the must is boiled until its volume is reduced by two-thirds, and it is then added to new wine in lieu of alcohol. At first the manufacturers added this cooked wine at the first racking, but they found that the results were not good, so they altered their practice, and they now add it to the new wine as it is being casked, in the proportion of from 5 to 10 per cent. It is well to add the cooked wine before the must begins to ferment, as then the whole mixes up well and produces a stronger wine; after this it is allowed to clarify. A couple of months prior to casking a preliminary trial is made, which consists in examining each cask to see if the wine has the required qualities of the well-known Marsala: those that have not are marked and put aside for distilling; those of doubtful quality are set apart for further trial.

Great experience is required to appreciate the quality of the wine contained in each cask by sight, smell and taste.

Towards the end of March and the beginning of April a further trial is made on the wines put aside as doubtful. Then the racking begins, the wine being put into casks containing about 12 hectolitres. If any wine is not up to the mark it is alcoholized, and is put by for the rest of the season. In the English manufactories pumps and tubes are not used, as they prefer pouring the wine into cans, so that it may be seen when it begins to run thick.

During the ensuing year, before the time of the vintage, a fresh trial is made, after which those wines that require it are cleared. This is done by dissolving a certain quantity of isinglass, so as to produce enough froth to cover the surface of the wine contained in the cask. This froth is poured in through the bung-hole; and with a short stick, flattened at the end, the surface of the wine is moved to and fro so as to spread the froth over the entire surface. It is then left alone, and the isinglass gradually finds its way to the bottom, carrying with it every foreign substance, and leaving the wine clear. The English manufacturers used formerly white of egg and blood to clarify their wines, but they now find it more advantageous to employ isinglass. The wine, once clarified, is drawn and put into casks, care being taken to add alcohol to those that require it. Two months after this operation the wine is subjected to a further trial, when all that is not condemned to be distilled is poured into large vats containing as much as 800 hectolitres each. Smaller ones, from 130 to 180 hectolitres, are also used; and in order to get an unvarying type of wine, care is taken never to empty these vats except when absolutely necessary for repairs, but to add the new wine to the old.

These huge vats are in the shape of two truncated cones set one against the other at the large ends. Those of average capacity are laid down on their sides, and by never emptying them, they get so impregnated with alcohol that for repairs it is not only necessary to empty them completely, but to leave them open for some time in order to get rid of the alcoholic vapours, that would be enough to kill the coopers employed if sent in too soon.

In these large vats the wine gets matured, and previous to exportation it is alcoholized according to its being for the English or the Italian market.

The making of the casks requires a few words. They are called pipes, of 400 litres, quarter casks, or octaves, according to their capacity. When made they are filled with boiling water, so as to close up all the pores of the wood, and after a month they are emptied and filled with a poor wine for two or three months, after which a better sort of wine is poured into them for the same period. When required for exportation, they are emptied and cleaned by the use of chains. When filled, they are put into an outer cask for better protection.

* From a Report on the Trade and Commerce of Palermo and Sicily by Mr. Consul Churchill.

MICROSCOPICAL CHARACTERISTICS OF VEGETABLE FIBRES.

In a paper on this subject in the *Zeitschrift für Warenkunde*, Dr. V. Berthold classifies the more important vegetable fibres, according to the action upon them of iodine and sulphuric acid, as follows:—

A. Coloured blue, violet, or green by iodine and sulphuric acid:—Flax, Chinese grass and ramie (*Boehmeria nivea*), roa (*Pipturus argenteus*), cotton, hemp, and sunn-hemp (*Crotalaria juncea*).

I. Transverse sections coloured blue or violet, but showing no yellow middle lamella; cell-cavity usually filled with a yellow mass.

a. Flax.—Transverse sections occur either isolated or a small number grouped together; the separate transverse sections are not contiguous; they are polygonal, bounded by straight lines, and have sharp edges. Lamination evident, blue or yellow cell-cavity, yellow dot. Longitudinal distortions of the striæ are indicated by darker lines, which usually cross.

b. Chinese Grass and *Ramie.*—Transverse sections isolated or a small number in a group; their connection very loose; they are polygonal or irregular, and very large. Lamination very evident; cell-cavity large and irregular, often filled with dark yellow masses; sometimes striated radially. The breadth of the fibres is very variable, in the longitudinal aspect some appear very broad; distortions evident; the ends thickly rounded.

c. Roa-fibre.—Transverse sections not many in a group, polyhedral, usually with straight or slightly curved sides and rounded edge; cell-cavity narrowly oblong, regular; contents sometimes yellow. Some transverse sections are surrounded by a thin greenish lamella, and show well-marked radial striæ or fissures, and concentric lamination; the separate lamellæ vary in depth of colour.

d. Cotton.—Transverse sections always isolated, rounded, of various forms, usually kidney-shaped; cell-cavity narrow, linear; contents usually yellow. No lamination.

II. Transverse sections blue or violet, polyhedral, rounded or irregular, always surrounded by a yellow middle lamella.

a. Hemp.—Transverse sections always in groups, contiguous, with rounded edge, surrounded by a thin yellow middle lamella, beautifully laminated concentrically; cell-cavity linear, simple or branched, irregular, sometimes broad, without contents.

b. Sunn-hemp. — Transverse sections numerous in a group, closely contiguous, resembling those of hemp, often sickle-shaped, either polyhedral or oval, with a small round cell-cavity; often with yellow contents. Surrounded by a broad yellow middle lamella, from which the inner laminæ are often detached.

B. Coloured yellow by iodine and sulphuric acid.

I. Dicotyledons. No vessels besides the bast-fibres; cell-cavity with constrictions.

1. Transverse sections in groups, polygonal, bounded by straight lines, with sharp edges; cell-cavity round or oval, smooth, empty; surrounded by a narrow middle lamella of the same colour.

a. Jute. — Cell-cavity large, roundish, oval; middle lamella very narrow; no lamination; the ends always rounded, and almost always strongly thickened.

b. Abelmoschus.—Transverse sections larger than in *a*, bounded by straight lines, sharp-edged; cell-cavity a dot or line, oval, rarely angular, smaller than in *a*. Fibres of uniform thickness, ends broad, rounded, often thickened; cell-cavity variable, often reduced to a line.

2. Transverse sections always in groups, polygonal, bounded by straight lines, with sharp or slightly rounded edges; cell-cavity empty. Middle lamella broad and decidedly darker than the transverse section; cell-cavity with constrictions, locally entirely absent.

a. Hibiscus.—Edges sharp or rounded; in the first case the cell-cavity small, in the latter case broader and oval; middle lamella sometimes wanting; transverse sections only slightly and inconspicuously laminated. Fibres of very various thickness, not usually striated longitudinally; ends blunt and almost always thickened.

b. Urena sinuata.—Edges sharp; cell-cavity very small, a dot or narrow short line; middle lamella broad and very distinct; transverse section not laminated. Fibres of uniform thickness, rarely striated longitudinally; ends rounded, rarely somewhat thickened.

II. Monocotyledons. Vessels in addition to bast-fibres; cell-cavity without constrictions.

1. Transverse section usually rounded, rarely polyhedral; cell-cavity always round; no middle lamella.

a. New Zealand Flax (*Phormium tenax*).—Transverse sections small, usually round, closely contiguous, polygonal, with rounded edges; cell-cavity empty. Fibres thin, uniform, smooth, rigid; cell-cavity small, of uniform breadth, without striation or distortion; ends sharp.

c. Manila Hemp. (*Musa textilis*). —Transverse sections polygonal, with rounded edges or roundish; cell-cavity large, roundish, sometimes with yellow contents. Fibres of uniform thickness, smooth, not striated, with thin walls; ends sharp or slightly rounded. After combustion of the fibre siliceous skeletons remain behind in the form of strings.

2. Transverse section evidently polygonal; cell-cavity polygonal, with one or more sharp edges, moderately large; no middle lamella.

a. African Hemp (*Senseviera*).—Transverse sections closely contiguous, not laminated. Fibres thin, smooth, with sharp ends.

b. Aloe.—Transverse sections not very numerous in a group; edges slightly rounded; cell-cavity not very large, polygonal, often with rounded ends; large spiral vessels. Fibres of uniform thickness, without structure; ends sharp or rounded.

c. Agave.—Transverse sections polygonal, bounded by straight lines; closely contiguous; cell-cavity large, polygonal; its edges less sharp. Fibres rigid, considerably broader towards the middle; ends broad, thickened, sometimes split.

3. *Yucca.*—Transverse sections polygonal, closely contiguous, small, bounded by straight lines; edges very sharp; cell-cavity small, round or linear; middle lamella very evident. Fibres narrow, striated, with sharp ends.

THE DETERMINATION OF TANNIN IN VEGETABLE CELLS.

In the 'Proceedings' of the Cambridge Philosophical Society Mr. W. Gardiner assigns reasons for objecting to all the microchemical reagents hitherto used for the detection of tannin. Iron sulphate he finds convenient when the products are blue and not green. He prefers to use a solution of ammonium molybdate in concentrated ammonium chloride; this gives with tannins a copious yellow precipitate. It can also be used for determining the presence of digallic acid, with which it produces only a red colour; the compound with gallic acid is soluble in ammonium chloride, while that with tannin is not.

The determination of tannin in tissues preserved in alcohol is facilitated by the fact that dead protoplasm gives a permanent precipitate with tannins.

The author regards tannins as secondary products of metastasis, especially when this process is very active, and thinks that they have no further use in the vegetable economy. In the old leaves of a cutting of the cherry laurel which had already put out roots and shoots, the quantity of tannin had considerably increased.

THE POSITION OF PHARMACISTS IN RELATION TO THE PHARMACOPŒIA.

The following is a complete list of the petitions, together with the number of signatures to each, presented in the House of Commons between the 18th and the 25th of August inclusive, in favour of an alteration of the Medical Bill in the direction desired by the Council of the Pharmaceutical Society:—

August 18.

Pharmaceutical chemists and chemists and druggists, Ryde (*Mr. Ashley*)	14
— West Bromwich (*Mr. Brogden*)	16
— Wednesbury (*Mr. Brogden*)	7
Medical practitioners of West Bromwich (*Mr. Brogden*)	7
Pharmaceutical chemists and chemists and druggists, Edinburgh (*Mr. Buchanan*)	27
— Edinburgh (*Mr. Buchanan*)	77
— Kirkaldy, N.B. (*Sir George Campbell*)	17
— Birmingham (*Mr. Chamberlain*)	23
— — (*Mr. Chamberlain*)	42
— Chiswick and other places (*Sir Charles Dilke*)	30

F. M. Rimmington and others (*Mr. Forster*)..... 23
Pharmaceutical chemists and chemists and druggists, Cambridge (*Mr. William Fowler*) 18
— Clifton and other places (*Mr. Lewis Fry*) 70
— Southampton (*Mr. Giles*)..... 14
— City of Worcester (*Mr. Rowley Hill*)..... 20
— Taunton (*Sir Henry James*)..... 12
Hamilton Kinglake, M.D., Taunton (*Sir Henry James*) 1
Medical practitioners of Penrith and Appleby (*Mr. William Lowther*) 13
Pharmaceutical chemists and chemists and druggists in London and other places (*Sir William M'Arthur*) 22
— Grantham (*Mr. Mellor*) 16
— High Wycombe (*Lieut.-Col. Gerard Smith*) 7
— Newton, Monmouth (*Mr. Hanbury-Traey*) 6
— Selkirk and other places (*Mr. Trevelyan*)..... 10
— Liverpool (*Mr. Whitley*) 56
— — (*Mr. Whitley*) 94
— — (*Mr. Whitley*) 80

August 20.

Pharmaceutical chemists and chemists and druggists, Fenton, and other places (*Mr. Broadhurst*) 21
— Dunfermline (*Mr. Campbell-Bannerman*) 6
— Colchester (*Mr. Causton*)..... 9
— Maldon (*Mr. Courtauld*) 5
— James Hart, and others (*Mr. Cross*) 24
— Neath (*Mr. Dillwyn*) 7
— Aberdeen (*Dr. Farquharson*) 17
— Dumfries (*Dr. Farquharson*) 20
— Forfar (*Dr. Farquharson*) 3
— Inverness (*Dr. Farquharson*) 8
Medical practitioners of Axmouth and other places (*Dr. Farquharson*) 5
— Stockport (*Dr. Farquharson*) 6
Pharmaceutical chemists and chemists and druggists, Bodmin (*Mr. Leveson Gower*) 3
— Abergele (*Lord Richard Grosvenor*) 3
— Bridgnorth (*Lord Richard Grosvenor*) 4
— Carmarthen (*Lord Richard Grosvenor*) 8
— Oswestry (*Lord Richard Grosvenor*) 7
— Hyde (*Lord Richard Grosvenor*) 7
— Carnarvon (*Lord Richard Grosvenor*) 5
— R. D. Commans and others (*Sir Arthur Hayter*) 19
— Gateshead (*Sir Farrer Herschell*) 10
— Carlisle (*Sir Farrer Herschell*)..... 20
— North Shields (*Sir Farrer Herschell*)..... 17
— Whitehaven (*Sir Farrer Herschell*)..... 18
— Darlington (*Sir Farrer Herschell*) 17
— Morpeth (*Sir Farrer Herschell*) 2
— Hexham (*Sir Farrer Herschell*) 3
— Bishop Auckland (*Sir Farrer Herschell*) 7
— Wigton, in the county of Cumberland (*Sir Farrer Herschell*)..... 4
— Peckham and neighbourhood (*Sir William M'Arthur*) 18
— Barnstaple and other places (*Sir Stafford Northcote*) 22
— Lincoln (*Mr. Hinde Palmer*) 25
— Kingston-on-Thames and neighbourhood (*Sir Henry Peek*) 15
Medical practitioners of Edinburgh (*Sir Lyon Playfair*)..... 18
Pharmaceutical chemists and chemists and druggists of Devonport (*Mr. Puleston*) 13
— Cardiff (*Sir Edward Reed*) 30
— Maidstone (*Mr. Alexander Henry Ross*)..... 12
— Dudley (*Mr. Sheridan*)..... 9
— Stalybridge (*Mr. Summers*) 5
— Ipswich (*Mr. Thornhill*) 14
— Bury Saint Edmunds (*Mr. Thornhill*) 13
— Harwich (*Mr. Thornhill*)..... 4
Pharmaceutical chemists and chemists and druggists, Macclesfield (*Mr. Henry Tollemache*)..... 12
— Stockport (*Mr. Henry Tollemache*) 16
— Chester (*Mr. Henry Tollemache*)..... 25
— Tottenham and neighbourhood (*Mr. Torrens*) ... 10
— London (*Mr. Torrens*) 32
— — (*Mr. Torrens*) 16
— — (*Mr. Torrens*) 6
— — (*Mr. Torrens*) 6
— — (*Mr. Torrens*) 11
— — (*Mr. Torrens*) 24
— — (*Mr. Torrens*) 14
— — (*Mr. Torrens*) 8
— — (*Mr. Torrens*) 35
— — (*Mr. Torrens*) 87
President and Council of the Pharmaceutical Society of Great Britain (*Mr. Torrens*) Seal.1
Pharmaceutical chemists and chemists and druggists of Hackney (*Sir J. Eardley Wilmot*) 6
— Spalding (*Mr. Rowland Winn*) 8
— Stamford (*Mr. Rowland Winn*) 5
— Boston (*Mr. Rowland Winn*) 15
— Petersfield 3

August 21.

Medical practitioners of Elgin (*Mr. Asher*) 6
Pharmaceutical chemists and chemists and druggists of Elgin and other places (*Mr. Asher*) ... 10
— Cirencester and other places (*Sir Michael Hicks-Beach*) 13
— Brighton (*Sir Thomas Brassey*) 52
— Hastings and Saint Leonards (*Sir Thomas Brassey*) 21
— Worthing (*Sir Thomas Brassey*) 5
— Hastings (*Sir Thomas Brassey*) 29
— Chichester (*Sir Thomas Brassey*) 9
— Saint Austell (*Mr. Brett*)..... 5
— Saint Ives (*Mr. Brett*) 3
— Falmouth (*Mr. Brett*) 5
— Helston (*Mr. Brett*) 2
— Peterborough (*Mr. Sydney Buxton*) 17
— Montrose (*Mr. Charles Cameron*) 5
— Paisley (*Mr. Charles Cameron*) 21
— Huntly, N.B., and other places (*Mr. Charles Cameron*)..... 11
Medical practitioners of Harwich (*Mr. Charles Cameron*) 2
— Great Marlow (*Mr. Charles Cameron*) 4
— Leek, in the county of Stafford (*Mr. Charles Cameron*)..... 7
Pharmaceutical chemists and chemists and druggists of Ludlow (*Colonel Windsor Clive*)..... 5
— London (*Mr. Cohen*)..... 18
— Croydon (*Mr. Cohen*) 13
— London (*Mr. Cohen*)..... 31
— — (*Mr. Cohen*) 6
— — (*Mr. Cohen*) 9
— — (*Mr. Cohen*) 10
— — (*Mr. Cohen*) 41
— Albert W. Waring and others (*Mr. Cohen*) 16
— Greenwich (*Mr. Cohen*) 16
— London (*Mr. Cohen*)..... 13
— — (*Mr. Cohen*) 12
— — (*Mr. Cohen*) 21
— Norwich and other places (*Mr. Cohen*) 15
— London (*Mr. Cohen*)..... 22
— Redruth and other places (*Mr. Cohen*) 8
— Wandsworth (*Mr. Cohen*) 5
— Clapham and neighbourhood (*Mr. Cohen*)..... 16
— New Cross and neighbourhood (*Mr. Cohen*) 12
— Norwich (*Mr. Colman*) 18
— Liskeard (*Mr. Courteney*)..... 4
— Newcastle (*Mr. Cowen*) 52
Medical practitioners of Newcastle-on-Tyne (*Mr. Cowen*) 16

Pharmaceutical chemists and chemists and druggists of Southport (*Sir Richard Cross*) 11
— Rochdale (*Sir Richard Cross*) 15
— Blackburn (*Sir Richard Cross*) 21
— Ashton-under-Lyne (*Sir Richard Cross*) 13
— Evesham (*Mr. Dixon-Hartland*) 5
— Calne (*Lord Edmond Fitzmaurice*) 3
— Richmond, in the connty of York (*Mr. Forster*). 5
— Ripon (*Mr. Forster*) 6
— Grimsby (*Mr. Forster*) 27
— Middlesborough (*Mr. Forster*) 10
— Malton (*Mr. Forster*) 6
— York (*Mr. Forster*) 31
— Selby (*Mr. Forster*) 5
— Windsor (*Mr. Richardson-Gardner*) 14
— Dalkeith (*Mr. William Ewart Gladstone*) 3
— Whitby (*Mr. Herbert Gladstone*) 5
— Pontefract (*Mr. Herbert Gladstone*) 5
— Bridlington (*Mr. Herbert Gladstone*) 12
— Doncaster (*Mr. Herbert Gladstone*) 11
— Harrogate (*Mr. Herbert Gladstone*) 14
— Dewsbury and other places (*Mr. Herbert Gladstone*) 15
— Leeds (*Mr. Herbert Gladstone*) 30
— — (*Mr. Herbert Gladstone*) 30
— Brentwood and other places (*Mr. Grantham*) ... 3
— Oldham (*Mr. Hibbert*) 28
— Rye (*Mr. Inderwick*) 2
— Dorking (*Sir Trevor Lawrence*) 5
— Guildford (*Sir Trevor Lawrence*) 7
Medical practitioners of London (*Sir Trevor Lawrence*) 12
— — — (*Sir Trevor Lawrence*) 19
— Hampstead (*Mr. Lyons*) 18
— Chesterfield (*Mr. Lyons*) 10
— Wakefield (*Mr. Mackie*) 16
Pharmaceutical chemists and chemists and druggists of Nuneaton and other places (*Mr. Newdegate*) 11
— Leamington (*Mr. Newdegate*) 20
— Northampton (*Mr. Newdegate*) 10
— Rugby (*Mr. Newdegate*) 7
— Warwick (*Mr. Newdegate*) 11
— Plymouth (*Sir Stafford Northcote*) 37
— Totnes (*Sir Stafford Northcote*) 7
— Torquay (*Sir Stafford Northcote*) 15
— Plymouth (*Sir Stafford Northcote*) 2
— Tiverton and other places (*Sir Stafford Northcote*) 9
— Kilmarnock (*Mr. Dick Peddie*) 3
— Manchester (*Sir Lyon Playfair*) 84
— — (*Sir Lyon Playfair*) 51
— — (*Sir Lyon Playfair*) 66
— Leominster (*Mr. Rankin*) 5
— Llandudno (*Mr. Rathbone*) 7
— Halifax (*Mr. Thomas Shaw*) 13
— London (*Mr. Torrens*) 8
— Knaresborough (*Mr. Torrens*) 3
— — (*Mr. Torrens*) 4
— Thirsk (*Mr. Torrens*) 5
— Brecon (*Mr. Torrens*) 4
— Lewes, in the county of Suffolk (*Mr. Torrens*) ... 7
— R. D. Commans and others (*Mr. Wodehouse*) ... 18
— Burslem (*Mr. Woodall*) 12
— Sheffield (*Mr. Stuart-Wortley*) 30
— Lyme Regis 3
— Fareham and Titchfield 4
— Landport and other places 18
— Poole 5
— Salisbury 11
— Andover 8
— Gosport 8
— Weston-super-Mare 8
— Bournemouth 18
Pharmaceutical chemists and chemists and druggists of Bridport 3
— Lymington 2
Pharmaceutical chemists and chemists and druggists, Devizes 7
— Southsea 18
— Winchester 8

August 22.

Pharmaceutical chemists and chemists and druggists, Lynn (*Mr. Bourke*) 17
— Leith and Newhaven (*Mr. Buchanan*) 13
— Haddington (*Mr. Buchanan*) 2
— Slough (*Mr. Carington*) 4
— Abingdon (*Mr. Carington*) 5
— Leighton Buzzard (*Mr. Carington*) 7
— Marlow (*Mr. Carington*) 4
— Bedford (*Mr. Carington*) 11
H. C. Webb, Market Square, Buckingham, pharmaceutical chemist (*Mr. Carington*) 1
Pharmaceutical chemists and chemists and druggists of Buxton (*Lord Edward Cavendish*) 7
— Banff, Macduff and Portsoy (*Mr. Duff*) 10
— Coventry (*Mr. Eaton*) 22
— Congleton (*Mr. Alan de Tatton Egerton*) 8
— Horsham and Crawley (*Sir Henry Fletcher*) 5
— Gloucester (*Mr. Lewis Fry*) 15
— Tewkesbury (*Mr. Lewis Fry*) 6
— Chippenham (*Sir Gabriel Goldney*) 4
— London (*Mr. Daniel Grant*) 9
— — (*Mr. Daniel Grant*) 24
— — (*Mr. Daniel Grant*) 34
— — (*Mr. Daniel Grant*) 20
— — (*Mr. Daniel Grant*) 3
— — (*Mr. Daniel Grant*) 12
— — (*Mr. Daniel Grant*) 30
— Hampstead, Hendon and Finchley (*Mr. Daniel Grant*) 19
— Uttoxeter (*Secretary Sir William Harcourt*) 6
— Nottingham (*Secretary Sir William Harcourt*) ... 23
— Leicester (*Secretary Sir William Harcourt*) 26
— Watford (*Secretary Sir William Harcourt*) 6
— Nottingham (*Secretary Sir William Harcourt*) ... 34
— Chesterfield (*Secretary Sir William Harcourt*) ... 13
— Derby (*Secretary Sir William Harcourt*) 22
— Leek (*Secretary Sir William Harcourt*) 5
— Newcastle-under-Lyme (*Secretary Sir William Harcourt*) 5
— London (*Sir Andrew Lusk*) 20
— — (*Sir Andrew Lusk*) 14
— — (*Sir Andrew Lusk*) 22
— — (*Sir Andrew Lusk*) 21
— — (*Sir Andrew Lusk*) 22
— Warrington (*Mr. M'Minnies*) 11
— Weymouth (*Sir Stafford Northcote*) 10
— Teignmouth (*Sir Stafford Northcote*) 4
— Exeter (*Sir Stafford Northcote*) 22
— Cheltenham (*Sir Stafford Northcote*) 21
— Bury (*Mr. Phillips*) 20
— Hartlepool (*Mr. Thomas Richardson*) 15
— London 20

August 23.

Pharmaceutical Chemists and Chemists and Druggists of Scarborough (*Mr. Dodson*) 23
— Stafford (*Mr. M'Laren*) 9
— Sunderland (*Mr. Storey*) 27

August 25.

Pharmaceutical Chemists and Chemists and Druggists of Shrewsbury (*Mr. Cotes*) 15
— Leeds and neighbourhood (*Mr. William Ewart Gladstone*) 10
— Eastbourne (*Mr. Gregory*) 15
— Wareham (*Mr. Guest*) 3
— Burnley (*Marquis of Hartington*) 16
— Longton (*Mr. Woodall*) 8

The Pharmaceutical Journal.

SATURDAY, JANUARY 26, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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MATERIALS FOR SURGICAL DRESSINGS.

THE peaceful revolution which the art of surgery in so far as the treatment of wounds is concerned has undergone since Mr.—now Sir JOSEPH—LISTER first broached his views respecting septic poisoning has brought in its train a whole army of antiseptic solutions and dressings concerning which previous generations of pharmacists knew little or nothing. Some time ago several pages in this Journal were devoted to an article on the subject of antiseptic pharmacy and since then every effort has been made to keep our readers *au courant* with the literature devoted to the subject. In doing this we have had occasion to mention a number of substances that have been recommended from time to time as suitable materials for surgical dressings, amongst them peat, moss, wood-wool, jute, oakum, absorbent cotton, etc. It has not always been evident upon what special properties the recommendation of a particular substance has been based, and probably the *raison d'être* has been usually to be found closely associated with the pecuniary interests of the promoter. But in respect to one substance which has been recommended—sphagnum moss—it may be assumed that it is hardly open to that reproach, if reproach it be, since an ample supply of it is available to any person choosing to seek for it. Moreover, it presents one advantage in that its supposed merits have been intelligently discussed in comparison with other materials in a pamphlet by Dr. H. LEISRINK.

The antiputrescent property of peat-moss has long been known, though probably the only account to which it has yet been turned by pharmacists has been in the preservation of leeches. This preservative property has been attributed to the humic and allied acids resulting from the slow oxidation of the wet cellulose, and therefore the older the peat, and consequently the further the oxidation has proceeded, the more powerful is this action found to be. But this change is accompanied by other physical alterations that affect the capability of the peat for absorbing liquids, which indeed it loses entirely after it has been once dried. Even in this condition, however, it appears to be not without its surgical uses, for Dr. NEUBER, of Kiel, says that he has found that a wound dressed with a paste made by triturating dried black peat with water to heal without formation of pus. These considerations appear to have turned the attention of Dr. MIELCK and Dr. LEISRINK to the "bog moss" which forms so important a constituent of peat, with the result that they came to the conclusion that in the widely distributed different species of *Sphagnum* the surgeon has at his command an unlimited supply of a material which from its elasticity and especially its capability of sucking up liquids,—absorbing is hardly a sufficiently strong word,—makes an unsurpassed dressing for receiving the discharge from open wounds. It does not appear, however, that the unaltered sphagnum possesses any antiseptic properties; on the other hand, it is not thought likely to set up any septic action, though for safety it may be submitted before use to the action of a jet of steam or moistened with a weak solution of corrosive sublimate. Its chief value appears to lie in its extraordinary avidity for liquids, which allows of it receiving a discharge until it has been increased to as much as eight times its original weight, without showing a sign of supersaturation. The explanation of this property is to be found in the known peculiarity of structure of the sphagnum, upon which indeed its capability of performing its very useful part in the economy of nature is dependent. According to SACHS, as the development of the young leaf progresses the cells of the veinless lamina become differentiated into large broad lozenge-shaped cells and narrow tubular cells running between and bounding them, the latter forming chlorophyll granules and constituting the functional tissue of the leaf. The larger cells, however, lose the whole of their contents, and hence appear colourless; whilst in their walls are large dots, with thickened edges, the part of the cell-wall enclosed by the dot becoming absorbed, and forming large usually circular holes. The epidermal tissue of the stem and branches also consists of from one to four layers of broad thin-walled empty cells, which in *S. cymbifolium* possess spiral thickenings and round holes similar to those of the leaves. It is these colourless cells, both of the leaf and the stem and branches, that serve as a capillary apparatus for the plant, through which the water of the bogs in which sphagnum grows is raised and carried to the upper parts, penetrating to the very summits as in a sponge, even when the tufts stand high above the water-level. The capillary action which the sphagnum exercises is therefore widely spread throughout the plant, whilst in jute and similar substances this is limited to the interstices between the individual fibres. The whole of this mechanism of imbibition is admirably explained and figured in the pamphlet 'Der Torfmoos-Verband,' to which reference has been already made.

It was not to be expected, however, that the superiority of sphagnum, even in this respect, would remain unchallenged by the advocates of rival substances. But in a number of comparative experiments, the results of which are published, sphagnum

appears at least to have held its own, and quite justified Dr. Leisrink's claim that when carefully collected, dried and made into pads or pillows, it forms a surgical dressing which, whilst extremely elastic and hence adapting itself closely to the surface to which it is applied, possesses the property of imbibing secretions to a remarkable degree. It would appear, however, that its value may be seriously affected by submitting it to too high a temperature during the operation of drying, by which indeed the structure of the moss, upon which its most characteristic property depends, is more or less extensively modified.

With commendable promptitude the Calendar of the Pharmaceutical Society of Great Britain for 1884 has been already printed and is now ready for delivery. To those who in previous years have made acquaintance with the useful volume which, under this name, the Society places annually at the disposal of chemists and druggists at a nominal sum nothing beyond the simple announcement is necessary; but it may be doing others a service to refer them to an advertisement of the Calendar that appears upon another page, from which they will see that, besides the lists of members and associates, as well as information respecting the examinations, the Benevolent Fund, and other matters more or less connected with the Society's operations, it contains a digest of a number of Acts of Parliament, Inland Revenue orders, etc., that have a bearing upon the business of a chemist and druggist.

* * *

After a delay of five months, the part of the official report on Public Petitions referring to the closing days of the last session has been delivered. On another page will be found an extract from it consisting of a list of the petitions that were presented in favour of an amendment of the late Medical Bill, in which provision should be made for the authoritative representation of pharmacists in any future committee that may be engaged in compiling a national Pharmacopœia. The total number of petitions inthe list is 259, signed by 4118 petitioners, and it will be seen that among them are several proceeding from medical practitioners.

* * *

The Special Board for Medicine of the University of Cambridge has just issued, for the guidance of students proceeding to medical and surgical degrees, a Schedule defining the range of the examination in Pharmacy and Pharmaceutical Chemistry. From this it appears that the subjects that the questions will have reference to are the weights and measures of the British Pharmacopœia and of the Metric System and their mutual relations; the nature and use of the pharmaceutical processes of infusion, decoction, distillation, percolation, and solution; the chief steps in the preparation of quinine, morphine, carbolic acid, salicylic acid, hydrocyanic acid, ether, chloroform, and the chlorides of mercury; the more important impurities or adulterations which may be associated with quinine, morphine, opium, ether, chloroform, iodide of potassium, subchloride of mercury, mercury with chalk, and sulphuric acid, together with the tests by which they may be detected; the chief instances of chemical incompatibility between drugs which are in common use; the proportions of the essential ingredients contained in the pharmacopœial preparations (for internal use) of arsenic, antimony, opium, atropine, morphine, quinine, and strychnine, and the chief ingredients of the more important compound preparations; and the common or popular names of the more important drugs and preparations. The student will moreover be expected to recognize ordinary specimens of the more important crude drugs and of the more characteristic preparations.

* * *

The *Lancet*, in an editorial article, enlarges upon the mischief caused by the unrestricted traffic in patent medicines, and remarks that it says little for our national morality that in order to keep up the dignity and discharge the obligations of the State it is found necessary or expedient to resort to such a questionable measure as the levying an impost on these articles. Our contemporary is of opinion that "Her Majesty's ministers ought to stamp out at once such a crying abuse, immoral in principle and fatal in practice." Incidentally, the article illustrates the remark we made recently as to the imperfect acquaintance with the actual facts possessed, as a rule, by those who discuss the subject. After mentioning approvingly the practice in France of stating the ingredients of a proprietary medicine on the label, the writer says, "Here, in England, if a chemist ventures in open honesty to state the composition of the medicines he sells he is in danger of being accused of contravening the patents law."

* * *

The *British Medical Journal* for the 19th inst. contains an account of an outbreak of trichinosis at Emersleben, in Prussian Saxony, which vividly illustrates the danger attending the eating of pig's flesh in the uncooked condition. After the selling of the flesh of a single pig in this village in September last, 250 persons out of a population of 700 were attacked with trichinosis and 42 died. Four persons on a visit to the village were attacked on their return home, and two died, and there were also nine fatal cases in a neighbouring village where some of the flesh was sold. The flesh appeared to exercise the most fatal effects when eaten before the salt or condiments had had time to act upon the trichinæ. In one instance a servant was attacked after eating a raw sausage made from the flesh, but other members of the household who ate some of the same lot of sausages which had been plunged in boiling soup for a few minutes escaped. In another case, a man who was known to have eaten three-quarters of a pound of the raw flesh enjoyed similar immunity, but, *pace* Sir Wilfrid, he had washed it down with a quart of brandy.

* * *

The resolution passed at a meeting held during the visit of the British Medical Association to Liverpool, in July last, appears to be now taking practical shape. A provisional Committee has issued a prospectus of a Medical Sickness Annuity and Life Assurance Society, including tables of the premiums for securing the payment during sickness incapacitating from professional duty of two, three or four guineas per week; the provision of annuities commencing at the age of 65; and the assurance of sums payable at death. The draft rules are published in the current number of the *British Medical Journal*, from which it appears that membership is to

be confined strictly to registered medical practitioners.

* * *

The Asclepiad is the title of a new quarterly periodical issued by Dr. B. W. Richardson, which is intended to be a "book of original research in the science, art and literature of medicine, preventive and curative." The first number opens with a paper on "Morphia Habitués and their Treatment," in which Dr. Richardson discusses the causes that usually tend to the formation of the morphia habit and the methods for its treatment. When it is desirable to attempt to break off this habit,—which, however, he does not do without taking into account the circumstances that led to its contraction,—he appears to prefer the plan of a systematic, firm and gradual withdrawal of the morphia extending over a period varying from seven to twenty-one days "unaided by any surreptitious alliances with substitutes." Nearly a third of the number is devoted to a characteristic paper entitled "Felicity as a Sanitary Research.

* * *

At a meeting of the Royal Society of Edinburgh, held on January 21, Mr. John Aitken contributed a very interesting paper on "The Effect of Heat on the Atmospheric Dust." The paper, which was illustrated by some brilliant experiments, was mostly of purely physical interest, but the following facts may be of interest to pharmacists. Mr. Aitken demonstrated that dust of all kinds is much more readily deposited on a cold than on a hot surface, and that moisture hinders the precipitation. These facts may explain why the membrane of the lungs is preserved so free from air impurities. It was also shown that a disturbed electrical condition of the atmosphere greatly favours the deposition of dust. Mr. Aitken suggests that this may be the explanation of the popular observation that milk more readily turns sour, and that other fermentive processes are more rapidly induced in thundery weather, the electrical conditions increasing the number of bacteria and other germs deposited in a given time.

* * *

In a review of the state of planting enterprise in Ceylon at the beginning of December, the *Ceylon Observer* puts forward a return of twenty-two millions as a "moderate" estimate of the number of cinchona trees two years old and upwards in the island. Our contemporary states that the quantity of bark that will be harvested depends upon the state of the home market, but that if prices improve there is no doubt an annual export of eight to ten million pounds of cinchona bark from Ceylon could be kept up for a long period to come. At the same time we learn from trustworthy sources of information here that there are signs of a very considerable falling off in the yield of bark, and that on many estates the cinchona plantations are rapidly dying out.

* * *

At the next meeting of the Chemists' Assistants' Association, to be held on Wednesday, January 30th, a paper on "Turpentine" will be read by Mr. F. H. Alcock.

* * *

The next meeting of the Manchester Pharmaceutical Association will be held at the Owens College (Medical Theatre, Coupland Street entrance), on Tuesday evening next, January 29, at 7.30 p.m., when a paper on "Cinchona Barks" will be read by Mr. William Elborne.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

The third meeting of the present session was held in the Society's Rooms, 119A, George Street, Edinburgh, on Wednesday, January 16, at half-past eight o'clock.

Mr. John Nesbit, President of the Branch, in the chair.

The minutes of the former meeting were read and confirmed.

The following donations were laid on the table, and thanks voted to the donors:—

To the Library—

Canadian Pharmaceutical Journal, 1883.

From the ONTARIO COLLEGE OF PHARMACY.

To the Museum—

Series of specimens in illustration of a paper on "The Shale Products Industry."*

From Mr. THOMAS STEPHENSON.

The President then called upon Mr. Dott to read a paper on—

THE SALTS OF NARCOTINE.

BY DAVID BROWN DOTT, F.R.S.E.,

The paper is printed on p. 581.

The President moved a vote of thanks to Mr. Dott, which was heartily accorded, and there being no discussion, the next paper, on—

THE PREPARATION OF GALAZYME OR ARTIFICIAL KOUMISS.

BY ADAM GIBSON,

was read by Mr. MacEwan.

The paper is printed on p. 582, and gave rise to the following discussion:—

The President, in moving a vote of thanks to Mr. Gibson, said that the process which he communicated appeared to be a very practical one, and judging from the analytical results it compared most favourably with that mentioned by Mr. Wanklyn. He thought, however, that cow's milk could never yield such a koumiss as that prepared from mare's milk; because the caseins contained in them, though chemically identical, differed physically, cow's milk giving a hard, and mare's milk a soft and easily digested curd. He believed that the superiority of true Russian koumiss was due to this property of mare's milk casein. It should not be forgotten that the koumiss used in this country was only a substitute for true koumiss (which it was impossible to import from Russia) and in these circumstances Mr. Gibson's paper could not fail to be of interest and value to those who had a demand for the article.

Mr. Gilmour seconded the motion and corroborated the President's remarks on the superiority of mare's milk koumiss. His experience of koumiss as supplied in this country led him to believe that it was an unsatisfactory article to deal with. He had recently heard of a case in which the first few bottles of a supply were admirable and were appreciated, but one bottle was so bad that it caused extreme gastric irritation, from which the patient was not likely to recover. It was possible that by adopting the process which had been communicated such unhappy results might be prevented, because the retailer could always know the age of the preparation; but he thought it necessary to point out that most scrupulous care should be taken to ensure thorough cleanliness of bottles and other vessels used, otherwise fermentation might be unduly accelerated and good and bad results be obtained from one brewing.

Mr. MacEwan returned thanks on behalf of Mr.

* *Pharm. Journ.*, January 19, 1884.

Gibson. He wished to emphasize the remarks made by the President, regarding the difference between Tartar koumiss and the artificial variety; no doubt the latter could not be so readily assimilated, but it was claimed for it that during the progress of fermentation, the casein was rendered more digestible. It had occurred to him that instead of skimmed milk the first portions of milk drawn during milking might be employed. It had recently been shown that these portions contained less than 1 per cent. of fat, while the last portions contained nearly 6 per cent. If, therefore, a supply of the former could be had, he thought that it would have an advantage over skimmed milk so far as freshness was concerned.

Mr. Gilmour said that it was well known that the last portions of milk (called "afterings" by country people) were extremely rich in fatty matter, and were much used by invalids. The first portions were correspondingly weak and would, he thought, be very suitable for koumiss.

A paper was then read on—

Aqueous Mixtures containing Powdered Chlorate of Potash.

BY JOHN RUTHERFORD HILL,

Pharmaceutical Chemist.

It is a common practice to prescribe gargles, mouth-washes and mixtures containing a much larger proportion of chlorate of potash than the aqueous menstruum is capable of dissolving and the object of the following note is to point out some objections to this practice and to suggest a more excellent way.

It not unfrequently happens that such gargles, etc., are ordered to be made with boiling water, but no discreet dispenser would be so foolish as to follow the directions of the prescriber in such a case, because, although the whole of the chlorate might thereby be dissolved, it would, of course, be deposited in a crystalline form as the solution cooled.

It sometimes happens, however, that the proportion of chlorate is very near the quantity which the menstruum is understood to be capable of holding in solution at the normal temperature; and in such cases, I believe, many dispensers do not hesitate to facilitate solution by the application of heat. Even in these instances there is always a risk that separation of crystals may ensue, either from an erroneous calculation as to the degree of solubility, or from the normal temperature falling considerably below that at which the solubility estimations were made; and consequently this process is not altogether free from objection.

The least objectionable method is generally understood to be that of reducing the chlorate of potash to very fine powder, using in all cases cold water only and attaching a "shake the bottle" label.

If the chlorate remained in the condition of fine powder this might meet the first difficulty, because, though not in solution, it would be in the next best condition for application to inflamed and ulcerated surfaces. Unfortunately, however, this is not the case, and chlorate of potash gargles, etc., so dispensed soon become unfit for use, owing to the rapidity with which finely powdered chlorate resumes the crystalline condition.

My attention had been frequently directed to this circumstance by observing that when such gargles, etc., had to be repeated there were very often present, in the bottle which had previously contained them, a few pretty large crystals of chlorate of potash. A short time since the subject was again brought very forcibly under my notice in the following manner.

About twelve months ago I dispensed a gargle containing ℥iv chlorate of potash in 8 ounces of water. About one half had been used at the time and the remainder set aside until about two months ago; at which time circumstances arose calling for the use of a similar remedy. The half empty bottle was brought to me to see if the same gargle would be suitable for this case, and I found that the whole of the undissolved chlorate of potash had, in the interval, passed from a condition of fine powder to that of pretty large tabular crystals, and the gargle was therefore, in a state quite unfit for use.

It occurred to me that it might be possible to prevent the chlorate resuming the crystalline form, at least for a reasonable length of time, by adding to the gargle some substance likely to interfere with crystallization. To determine this point the following mixtures were prepared:—

No. 1. Chlorate of potash ℥j. water to ℨj.
No. 2. Chlorate of potash ℥j. glycerine ℥j. water to ℨj.
No. 3. Chlorate of potash ℥j. simple syrup ℥ij. water to ℨj.
No. 4. Chlorate of potash ℥j. gum arabic gr. x. water to ℨj.
No. 5. Chlorate of potash ℥j. gum tragacanth gr. iij. water to ℨj.
No. 6. Chlorate of potash ℥j. honey ℥j. water to ℨj.
No. 7. Chlorate of potash ℥j. treacle ℥j. water to ℨj.

The chlorate of potash was in each case reduced to very fine powder, and the mixtures were all equally exposed to the variable temperature of an ordinary sitting-room.

On examining the specimens about twenty-four hours after they had been so exposed I found that in every one of them a portion of the chlorate had passed into the condition of very thin, sharp-edged tabular crystals, exhibiting in many cases the iridescent properties of thin transparent plates. The time of examination was on the morning of the second day when the temperature of the room was several degrees less than it had been in the course of the previous night; a circumstance which, I believe, has a good deal to do with the rapid change of the chlorate from a state of fine powder to that of sharp crystals.

When the temperature of the room rises a quantity of the chlorate passes into solution and is deposited in the crystalline condition as soon as the temperature falls. This accounts for the change so far as a portion of the chlorate is concerned, but does not explain how the whole becomes ultimately so altered. This, I think, is brought about in the following manner. When the temperature rises a portion of the chlorate dissolves and when the temperature falls it is deposited as crystals. On the temperature again rising a fresh portion of the powdered chlorate is dissolved, because the powder dissolves more readily than the crystals, and this second portion is in turn deposited, either as a fresh crop of crystals, or, more probably, as an addition to those already formed. In this way, with each day's variations in temperature, the process goes on until, as already stated, the whole of the chlorate takes the form of pretty large tabular crystals.

The theory that this change is at least very much accelerated by the variable temperature of an ordinary bedroom or sitting-room was confirmed in the following manner. A mixture containing 1 drachm of finely powdered chlorate in 1 ounce of water was kept for a month in a place where the temperature did not vary more than two or three degrees. At the end of that time it was found that the chlorate had passed into a state of small, somewhat granular crystals, showing only a slight tendency to form crystalline plates. In this condition, I believe, it would be less objectionable for use as a gargle than in the other case where a number of sharp-edged plates were formed; but, nevertheless, it appears that, even under the most favourable conditions, it is impossible to retain chlorate of potash in a state of fine powder in presence of water.

From what has been stated it will be apparent that none of the substances employed had the effect of preventing crystallization, and that a single day's exposure to the variable temperature of a sitting-room was sufficient to produce such an alteration of the chlorate as to render the gargle, etc., unfit for use. Treacle, tragacanth

and honey seemed to have a slight influence in retarding the process of crystallization; the crystals formed in these mixtures being of somewhat smaller size. They failed, however, to accomplish the object in view, which was not simply retardation but prevention. Thus, then, we have shown that the practice of prescribing such mixtures is open to a serious objection; but there is still another clause to the indictment.

Such gargles or mixtures are frequently directed to be taken in regular specified quantities; the intention being that each quantity should contain a definite dose of chlorate. In the case of a heavy salt like chlorate of potash, however, subsidence takes place so rapidly that, even though the bottle be vigorously shaken immediately before measuring out a dose, it is practically impossible to obtain a reasonable approach to uniformity, and, therefore, the intention of the prescriber cannot be attained.

The practice to which this note is meant to call attention is then, to say the least of it, shown to be undesirable; I believe it to be also unnecessary.

It is the province of the pharmacist to carry out, with strict fidelity, the directions of the physician, and he may not presume to dictate. While this is so, however, we believe that it is not only his province but his duty to draw attention to defects in prevailing methods and to devise improvements.

Believing this to be so, I venture to suggest that the practice referred to might be advantageously departed from, and that chlorate of potash for such purposes should always be prescribed in the form of powders. The patient could be directed to add the requisite quantity of water at the time of using; there would be no risk from crystallization; and the dose would be uniform. By this means both difficulties would be completely disposed of, and it would be, in every respect, a more excellent way.

The following discussion took place:—

Mr. Gilmour asked if the bottles had been shaken during the progress of the experiments.

Mr. Hill said that he had shaken them repeatedly so as to simulate, as far as possible, the ordinary conditions.

Mr. Gilmour then said that the formation of large crystals in these circumstances was contrary to his experience, large crystals of chemicals being obtained when the solutions were at perfect rest. The subject of crystallization was at all times an interesting one, and was particularly so in cases allied to the everyday work of the pharmacist. The explanation which had been given seemed to be correct, but he might point out that although the chlorate was practically in fine powder, still, in that condition, the crystalline form was merely minimized, and the minute crystals would form points of growth. He had much pleasure in moving a vote of thanks to Mr. Hill and complimented him on the practical manner in which he had treated a subject of general interest.

Mr. Stephenson seconded the motion and remarked that he was somewhat surprised to hear of the circumstance. It was of importance that such matters should be brought under their notice, for they had a serious aspect. He had hitherto acted upon the general opinion regarding such mixtures, namely, not to use hot water, bnt rather to reduce the chlorate to very fine powder. Mr. Hill's experiments sufficiently proved that crystallization could not be prevented by ordinary means, and he would suggest as a way out of the difficulty, that solutions under the saturation point should be prescribed.

Mr. Dott said that Mr. Hill's explanation of the matter was correct. The powdered chlorate was undoubtedly in the same crystalline condition as the unpowdered chlorate; still the former gave a larger surface than the latter and would pass more quickly into solution on the least rise of temperature, and when the temperature decreased it would necessarily be deposited as explained.

The President conveyed the thanks of the meeting to Mr. Hill, and remarked that he could not agree with the proposal to prescribe the chlorate in powder form. Powders were not good pharmacy, because the patient required to do what the pharmacist should do, namely, bring the remedy into a state suitable for administration. Apart from that, powders led up to a demand for the medicine in bulk, and in this demand the income of the pharmacist disappeared.

Mr. Mackenzie hoped that Mr. Hill would determine the solubility of the chlorate at different temperatures. Such solubilities would be of great use at the dispensing-counter, and would form a guide to the prescriber.

Mr. Gilmour now remarked that he was under the impression that when crystallization began the crystals continued to grow even after the solution was under the saturation point.

The President said that he also had that idea, and had seen it stated in some text-books that in the crystallization of carbonate of soda the mother liquor was not a saturated solution of carbonate.

Mr. MacEwan: Perhaps the mother liquor contained caustic soda, which would prevent the full proportion of carbonate remaining in solution.

The President, continuing, said that he thought the case referred to was that of recrystallization. Some time ago Mr. Dott, in a paper on Salicin, had stated that the mother liquor was always a saturated solution. Perhaps he might give his reasons for that statement.

Mr. Dott said that there was not the least ground for stating that crystallization would proceed indefinitely. Provided the temperature and volume were constant and the solution in presence of the deposited crystals, the solution would necessarily remain at the saturation point.

Mr. Hill then said that the interesting discussion which had arisen from his paper was a sufficient reward for any little trouble he had taken in the matter. He explained that it was the intention of the prescriber to order excess of the chlorate, and his suggestion was based on that fact. It had occurred to him that a determination of solubilities would be useful, and he would keep it in view, but there were certain circumstances which would negative the results in such cases as that under notice; thus tinctures (particularly tr. ferri perchlor.) were often prescribed along with the chlorate, so that the solvent power of the vehicle was diminished thereby. He might state that the solubility given by Squire (an authority often consulted by pharmacists) was 1 in 12, while Attfield gave it as 1 in 16. The latter was the better basis to work upon, but even that proportion is dangerous, seeing that it is so at 60° F., a temperature which is not at all constant.

Before the meeting adjourned, the President called attention to a herbarium exhibited by Mr. Thomas Stephenson, and for which he had been awarded a bronze medal by the Council of the Society. He hoped that other apprentices would turn their attention to field botany and form collections for the annual competition. The Society had other honours open to young pharmacists, particularly the Jacob Bell Scholarships, which, apart from their mere pecuniary value, gave their holders opportunity for advancement which could scarcely be obtained by other means. For these Scotchmen had equal rights with their friends on the other side of Tweed, and he hoped that some would ere long be successful in this competition.

Provincial Transactions.

ANNUAL DINNER OF THE NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

Last week about sixty members of the above Society dined together at the George Hotel, under the Presidency of Mr. Councillor Fitzhugh, F.C.S., the vice-chairs being occupied by Mr. J. Wilford and Mr. T. B. Fletcher.

The Hon. Secretary (Mr. C. A. Bolton) read severa

letters of apology, and announced donations from the following, towards the funds of the Society:—Mr. E. Harvey (Barron, Harvey and Co.), £5 5*s.*; Messrs. Hearon and Co. (per Mr. Rogerson), £5 5*s.*; Mr. R. Gibson, Manchester, £1 1*s.*; Mr. Ald. Witty, Hull, £1 1*s.*; Mr. J. S. Osborne, £1 1*s.*; Messrs. Burgoyne and Co., £1 1*s.*; Mr. Councillor Lees, £1 1*s.*; Mr. H. C. Mason, 5*s.*

After the usual loyal toasts had been duly honoured,

Professor Clowes proposed "Success to the Nottingham and Notts Chemists' Association." He said he was pleased to meet the members that night, and he had no doubt they had taken some interest in his endeavours at the University College to impart useful chemical instruction to those engaged in pharmacy in Nottingham. He hoped they would not think him too personal when he said that he was determined to make his department in the college very useful in that respect, and therefore, he had given a course of lectures which he thought were suited to the requirements of those attending the lectures. They represented such an important industry in the town that he considered that course of lectures necessary, and he thought he was justified in producing them. The numbers that had attended them and the course of instruction he had attempted had encouraged him to continue the lectures, which up to the present time had been eminently successful. They, as chemists, had to look upon themselves as the children of pharmacists. Early chemistry, no doubt, was concerned in the preparation of medicine, and the study of chemistry was pursued with the object of improving the preparation of existing ingredients, and the discovery of fresh ones. In the course of further remarks, Professor Clowes said he thought they did quite right in resenting the attempt which was made some time ago when the Institute of Chemists wanted to call themselves chemists *par excellence*, and oust them (his hearers) from the name of chemists. He (the speaker) considered that they had a perfect right to retain the name to which they had a special claim. Professor Attfield, who represented scientific chemistry perhaps more fully than anyone else, in a recent discourse had aimed at nothing less than making it a profession. Their President (Mr. Fitzhugh) considered that that aim was too lofty, but he (the speaker) disagreed with him on that point. Proceeding, Professor Clowes said chemists dealt in articles which ought to be pure, and it was extremely desirable that they should possess the confidence of the public. It was necessary that they should have some special education in order to perform their duties properly, and therefore he thought it was absolutely necessary that education should be given at the University College which would be of practical importance. He would be glad to receive any suggestions from the chemists regarding the instruction given in his own department. Being a public college it was necessary that it should do the work of the town. He thought the time had arrived when young men should be able gradually to receive such an education in Nottingham as would qualify them to pass at least their Minor examinations. That would be an attempt to introduce a system of gradual education in the place of the high pressure system. He would be glad to see a chemical association in Nottingham which would represent everyone engaged in chemistry. He was satisfied that the number of strictly scientific chemists was far too small, and, therefore, anyone engaged in chemical pursuits could not do better than take advantage of that admirable Association.

The Chairman, whose name was coupled with the toast, said he thought that meeting augured well for the future prosperity of the Society, the object of which, he took it, was to advance pharmaceutical chemistry. He quite agreed with the remarks of Professor Clowes, but, being a Conservative, he believed in advancing by degrees. The Chairman expressed the hope that they would get an amended Act of Parliament making Nottingham a centre, so that young men would not have to go to London to pass their Minor examinations. He thanked the company for the kind manner in which they had received the toast.

Mr. W. H. Parker also responded, and said the University College was an excellent institution, but it would not be much use without they had popular professors. He thought the young men of Nottingham owed Professor Clowes a debt of gratitude for the course of lectures he had given.

Mr. Holgate briefly proposed "The Pharmaceutical Society," to which Mr. Bolton felicitously responded, after which the annual collection was made on behalf of the Benevolent Fund, which amounted to £5 5*s.*

Mr. Beilby proposed "The President, Vice-President, and Officers of the Association," to which Mr. John Wilford and Mr. C. A. Bolton responded in appropriate terms.

The remaining toasts included "The Visitors," proposed by Mr. Warriner, and responded to by Mr. Harvey and Mr. Spencer; "The Chairman and Vice-Chairmen," proposed by Mr. Rogerson, and "The Ladies," proposed by Mr. R. H. Beverley, and responded to by Mr. Fred. Cobb.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

Professor Tyndall on Rainbows.

In a lecture delivered at the Royal Institution on Friday, the 18th inst., Professor Tyndall gave some interesting information concerning "Rainbows," and accompanied some of his statements by experiments. He commenced the subject by giving a detailed account of the history of the knowledge acquired concerning this phenomenon, stating that the most important discovery made in relation to it for a long period was the fact that the angle formed by the intersection of a line drawn from the observer to the rainbow with a line drawn from the sun to the rainbow always measured 41°. Taking this observation as a basis, Descartes explained theoretically the formation of the rainbow, and his theory was proved by Newton to be correct. The lecturer, after referring to the caustic curve, formed by aberration, then proceeded to show by means of diagrams the refraction and reflection which occur when a ray from the sun impinges upon a raindrop, and pointed out that these are the cause of the formation of the rainbow. He further showed that the phenomenon can only be seen when the observer and the sun are in the same relation as had been before noticed. In the continuation of his historical narrative, he designated Descartes and Newton as the discoverers of the formation of the "geometrical" rainbow, whilst he gave to Dr. Thomas Young the place of the first discoverer of the formation of the coloured zones or belts in the rainbow, adding that Sir George Biddle Airy had greatly contributed to prove the correctness of Dr. Young's statements.

Passing from the historical to the more general portion of the subject, Professor Tyndall explained the formation of the secondary rainbow, and the relations which its coloured zones bear to those of the primary rainbow. He then gave the particulars of a phenomenon noticed by himself, whilst residing in a hut on the Alps. Upon going to the door one foggy night, he saw his shadow thrown upon the fog by a small lamp hanging in the rear. This, in itself, was no new experience, but his attention was drawn to a well-defined white halo around the head of the shadow, a circumstance he had never observed before. He further mentioned that he had afterwards been able to reproduce this effect upon a small scale, and had arrived at the conclusion that this halo was really a rainbow, the formation of which was caused by the doorway allowing the light of the lamp to be thrown upon only a limited area of the fog. The fact that the halo was white Professor Tyndall considered to be due

to the particles of moisture being in such a fine state of division that they were not able to form the prismatic colours; in support of this latter theory, he stated that he had passed a ray of electric light through an atmosphere of steam, with the result of obtaining a white halo. The formation of a white rainbow by the sun's rays, though rare, has been seen in foggy weather; indeed, one had been observed shortly before last Christmas. By means of the electric light, an artificially produced fine spray and jets of steam, this and other points were illustrated and it was shown that when the spray consisted of a liquid having a higher refractive index than water, such as spirit of turpentine or petroleum, a more circumscribed bow was formed than with water spray, whilst when both were used at the same time two bows were formed, one within the other, and each with its corresponding secondary bow. From the conditions of the experiments these results were not all witnessed by the company present, but Professor Tyndall met the difficulty as far as possible by entering the artificial mist, clad in a waterproof, and describing what he saw.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, January 17. Dr. W. H. Perkin, President, in the chair.

The following gentlemen were declared by the scrutators, Dr. Thorn and Mr. D. A Louis, duly elected Fellows of the Society:—B. H. Brough, G. Daubeney, C. C. Hutchinson, W. S. Kilpatrick, E. Matthey, H. Peile, J. W. Pallister, R. Romanis. S. G. Rawson, F. M. Rogers, W. Robinson, T. Stenhouse, W. O. Senier, J. A. Voelcker.

The following certificates were read for the first time:—L. Archbutt, W. H. Barr, D. Bain, P. S. Chantrell, H. C. Draper, A. F. Damon, V. Edwards, W. T. H. Elsley, T. Hilditch, R. E. Moyle, P. Morton, W. J. Orsman, F. R. Power, H. G. Shaw, E. F. Smith, A. E. Simpson, A. Tarn.

The President then called on Mr. C. T. Kingzett to read a paper—

On Camphoric Peroxide and Camphorate of Barium.—Brodie states (*Phil. Trans.*, 1863, 407) that when anhydrous camphoric acid is triturated with an equivalent quantity of hydrated barium peroxide in the presence of ice-cold water and the mixture filtered, there is obtained a solution which is slightly alkaline and which when rendered acid has the following properties: it bleaches indigo, oxidizes potassium ferrocyanide, decomposes hydriodic acid, and evolves oxygen when heated, but fails to give a blue coloration with chromic acid and does not discolour potassium permanganate. Brodie concluded from his analysis, etc., that a new substance was formed which was a barium salt of camphoric peroxide $C_{10}H_{14}BaO_5$, and not a camphorate of barium peroxide. The author believes that Brodie's experiments admit of another explanation, which is probably correct, viz., that when camphoric anhydride is triturated with water and barium peroxide, the anhydride is first resolved by the addition of a molecule of water into camphoric acid, which, in its turn, decomposes barium peroxide, forming camphorate of barium and peroxide of hydrogen. The author then gives a detailed account of his repetition, with some slight variations, of Brodie's experiments, and he concludes that barium peroxide only acts upon camphoric anhydride in the presence of water, and that the action is of a secondary character, the anhydride first becoming camphoric acid, which decomposes the peroxide of barium and yields camphorate of barium. He also incidentally proves the existence of a crystalline hydrate of camphorate of barium containing one molecule of water—

$$C_{10}H_{14}O_3 + H_2O = C_{10}H_{16}O_4$$
$$C_{10}H_{16}O_4 + BaO_2 = C_{10}H_{14}BaO_4 + H_2O_2.$$

Dr. Armstrong said that no doubt some organic peroxides, as acetic peroxide, did exist. In Mr. Kingzett's communication he had called attention to the results of one of his previous papers, in which he claimed to have shown that by the air-oxidation of turpentine camphoric peroxide was formed, which was the source of the peroxide of hydrogen: no doubt some peroxide was formed, but that this should be camphoric peroxide appeared to him very doubtful, as there seemed to be no relation between the terpenes and camphor.

Mr. Kingzett, in reply, said it was principally from Brodie's experiments that he had concluded that camphoric peroxide was formed in the oxidation of turpentine; although peroxides of monobasic acids were known, if camphoric peroxide did not exist he did not think any peroxides of bibasic acids had yet been discovered.

The Secretary then read the following communications:—

Supplementary Note on Liebig's Production of Fulminating Silver without the use of Nitric Acid. By E. Divers and Michitada Kawakita.—The authors have succeeded in obtaining a very small quantity of fulmi nate by the action of nitrous acid, but under conditions which deprive its production of all significance. The fulminate was only produced when the temperature rose to about 60° and the liquid contained nitric acid.

On the Decomposition of Silver Fulminate. By E. Divers and Michitada Kawakita.—Silver fulminate, when treated with hydrochloric acid, yields as is the case with mercury fulminate, formic acid and hydroxyammonium chloride, but the authors have, as yet, only found two-thirds of the calculated quantity of each of these bodies. Traces of ammonia and hydrocyanic acid are also produced.

On Hyponitrites. By C. Divers and Tamemasa Haga—In this paper the authors resume an investigation commenced by Divers in 1871; they criticize especially the results and conclusions of Berthelot and Ogier, who gavs to silver hyponitrite the formula $Ag_4N_4O_5$. These chemist. do not seem to have thought that an acid of such a strange constitution as $H_4N_4O_5$ might be a mixture of hyponitrite, having Divers' constitution (HNO) mixed with nitrite and nitrate. The authors of the present paper have made many experiments purifying the hyponitrite in various ways. The final experiment consisted in dissolving the hyponitrite in nitric acid, precipitating with sodium carbonate, washing with water, acetic acid and again with water; all the operations being performed in an atmosphere of carbonic acid. This resolution and reprecipitation were performed several times; the product was finally dried in an atmosphere of carbonic acid, over sulphuric acid. The salt gave 77·69 per cent. of silver. AgNO contains 78·3 per cent. The constitution of the salt is, therefore, AgNO. The authors have hitherto failed to prepare hyponitrites either by Menke's method, heating potassium nitrate with iron filings, or by Zorn's process of using ferrous hydrate as the reducing agent.

Dr. Japp pointed out that Zorn had prepared an acid barium hyponitrite, and had shown that nitrous oxide was evolved when a hyponitrite was heated.

The Society then adjourned to February 7, when a paper "On the Influence of the Temperature of Distillation on the Composition of Coal Gas" will be read by L. T. Wright.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, January 10, Mr. H. G. Greenish, Vice-President, in the chair.

Mr. W. H. Ince read a paper on "Hydroxylamine," of which the following is the substance:—

Hydroxylamine.

BY W. H. INCE.

This compound, NH_3O, was discovered by Lossen in 1865, when he obtained it by acting on nitrous acid with tin and hydrochloric acid.

It may be prepared by several methods which involve

the action of nascent hydrogen upon an oxide of nitrogen, most readily by acting on zinc by dilute sulphuric acid, to which a few drops of nitric acid have been added.

Another easy method of preparation, lately discovered by Dr. Divers, is by acting on tin by a mixture of strong hydrochloric acid with one tenth of nitric acid.

$$9\,HCl + 4\,Sn = 4\,SnCl_2 + 4\,H_2 + HCl$$
$$4\,H_2 + 8\,HNO_3 + HCl = (NH_3O.\,HCl) + 3\,H_2O$$

The tin is precipitated by sulphuretted hydrogen, and the liquid evaporated over a water-bath to dryness; the resulting saline mass, which is a mixture of hydroxylamine hydrochloride and ammonium chloride is boiled with absolute alcohol, which dissolves out the hydroxylamine salt and a little of the ammonium chloride. The ammonium salt is precipitated by platinum perchloride, and the resulting hydroxylamine hydrochloride may be crystallized out, either from alcohol or water.

The formation of the ammonium salt is mainly due to the action of hydroxylamine on the metal.

I found that instead of precipitating the tin as sulphide, if sodium carbonate were added to the solution, so as to just render it alkaline (and so precipitate the tin as carbonate), then by filtering and carefully heating the filtrate over a water-bath until it ceases to smell of ammonia, the ammonium salt is decomposed, ammonia being given off, leaving hydroxylamine unacted upon.

But if this solution is evaporated or allowed to stand, the hydroxylamine is decomposed.

The hydroxylamine can be obtained from the liquid by reacidulating with hydrochloric acid, evaporating and extracting with absolute alcohol: on evaporating the alcoholic solution the hydroxylamine hydrochloride is deposited in crystals.

Another method consists in dissolving dry mercury fulminate in hydrochloric acid.

$$\underset{\text{Mercury fulminate.}}{HgC_2N_2O_2} + 4\,H_2O + 4\,HCl = \underset{\text{Hydroxylamine HCl.}}{2\,NH_3O.HCl} +$$
$$HgCl_2 + 2\,\underset{\text{Formic acid.}}{H_2CO_2}.$$

If the mercury fulminate is damp, hydrocyanic acid and hydroxylamine are formed.

I have found that many substances containing the NO_2 group when acted upon by nascent hydrogen, or by being dissolved in hydrochloric acid, reduce mercury and copper salts, pointing to the presence of hydroxylamine.

Thus pyroxylin (gun cotton), $C_6H_7(NO_2)_3O_5$, xyloidin, $C_6H_8NO_2O_3$, and nitromannite, $C_6H_8(NO_2)_6O_6$, treated as above, give hydroxylamine reactions.

I found that the action of benzene upon nitric acid yielded no hydroxylamine, but nitrobenzene, $C_6H_5NO_2$, when treated with zinc and hydrochloric acid, and the aqueous solution filtered from the aniline answered the tests for hydroxylamine.

Aniline was not found to reduce mercury or copper salts as hydroxylamine does.

I have endeavoured to obtain hydroxylamine by oxydizing ammonia, first by passing a stream of oxygen into a warm solution of ammonia (specific gravity ·88), and, secondly, by leaving ammonium chloride in an oxidizing mixture, such as sulphuric acid, oxide of manganese, and potassium bichromate; but in neither case was I successful.

Picric acid, which from its constitution $C_6H_2(NO_2)_3OH$ might be expected to yield hydroxylamine, gave no traces when dissolved in hydrochloric acid, or when acted on by nascent hydrogen.

The formation of hydroxylamine has usually been ascribed to the action of nascent hydrogen liberated by the action of the acid on the metal, for it can be obtained by passing nitrogen tetroxide into a flask in which hydrogen is generated—

$$2NO_2 + 6H_2 = NH_3O + NH_3 + 3H_2O.$$

But Dr. Divers asserts that no nascent hydrogen is required for the formation of hydroxylamine when nitric acid acts upon a metal.

The following is the probable reaction with zinc and nitric acid—

$$7\,HNO_3 + 3\,Zn = NH_3O + 2\,H_2O + 3\,Zn\,(NO_3)_2$$

In all cases hydroxylamine combines with the acid present forming a salt, as when hydrogen is liberated from zinc and sulphuric acid, the hydroxylamine is produced as sulphate $(NH_3O)_2H_2SO_4$. Hydroxylamine may be isolated by treating the sulphate with baryta water, which precipitates barium sulphate leaving hydroxylamine in solution—

$$(NH_3O)_2H_2SO_4 + BaH_2O_2 = 2\,NH_3O + BaSO_4 + 2H_2O.$$

It is an unstable colourless fluid, and uncrystallizable. It is quickly decomposed by strong potassium hydrate solution, giving off nitrogen and ammonia.

The constitution of hydroxylamine, according to the formula NH_3O might be expressed in two ways, nitrogen either acting as a triad or pentad element—

$$\begin{array}{ll} \diagup H & \diagup H \\ N—H & O{=}N—H \\ \diagdown O\,.\,H & \diagdown H \end{array}$$

As the salts of hydroxylamine are formed by taking the whole acid group into the element, the former is preferable, in fact hydroxylamine may be regarded as ammonia with the hydrogen replaced by the hydroxyl group OH. This is further confirmed by the fact that hydroxylamine is readily converted into ammonia.

All the simple salts of hydroxylamine are additive compounds, the principal ones are hydrochloride, $NH_3O\,.\,HCl$; sulphate, $NH_3O_2H_2SO_4$; nitrate, $NH_3O\,.\,HNO_3$, and cyanide, $NH_3O\,.\,HCN$. (isomeric with urea).

All the salts are soluble in water and absolute alcohol, and all decompose when strongly heated with violent evolution of ammonia and oxygen.

Hydroxylamine also forms substitution products, where one or more hydrogen atoms are replaced by monad organic radicles; these form simple salts with the acids.

$\diagup H$	$\diagup C_2H_5$	$\diagup C_2H_5$	$\diagup C_7H_5O$
$N—H$	$N—H$	$N—C_2H_5$	$N—C_7H_5O$
$\diagdown OH$	$\diagdown OH$	$\diagdown OH$	$\diagdown O\,.\,C_7H_5O$
Hydroxyl-amine.	Ethyl hydroxyl-amine.	Diethyl hydroxyl-amine.	Tribenzy hydroxyl-amine.

Hydroxylamine acts in two ways, either as a powerful reducing agent or as an oxidizer.

As a reducing agent it splits up into N, H_2O, and H, the H reducing metallic salts.

In solutions made alkaline with potassium hydrate it reduces cupric sulphate, throwing down a yellow precipitate, which is further reduced to red oxide on boiling.

$$2NH_3O + 2CuO = Cu_2O + 3H_2O + N_2.$$

It reduces silver and mercury salts to their respective metals.

1. $NH_3O + AgNO_3 = Ag + HNO_3 + H_2O + N.$
2. $NH_3O + HgCl_2 = HCl + HgCl. + H_2O + N,$
   then $NH_3O + HgCl = HCl + Hg + H_2O + N.$

It also reduces tin, lead, nickel and zinc salts.

When it acts as an oxidizing agent it gives up its oxygen, liberating ammonia.

Thus it converts aldehyde, CH_3COH, into acetic acid—

$$NH_3[O.CH_3COH].$$

It acts in a peculiar manner on dibromononitroethane, forming ethylnitrolic acid—

$$CH_3.C.Br_2.NO_2 + NH_3O = CH_3C.NOH.NO_2 + 2HBr,$$

and on thio-carbanilide, precipitating sulphur.

Hydroxylamine forms substitution products with benzyl, anisyl and cinnamyl, by replacing the hydrogen atoms of the hydroxylamine by the radicals.

First, those in which a chloride, as when benzoic chloride forms a substitution product with hydroxylamine hydrochloride, producing dibenzhydroxamic acid—

$$2NH_3O.HCl + 4C_7H_5O.Cl + 2Na_2CO_3 =$$
$$N.C_7H_5O.C_7H_5O.OH + 6NaCl + 3CO_2 + 3H_2O.$$

This acid forms a potassium salt, which, when acted

on by ethyl or methyl iodide, produces ethyl or methyl-dibenzhydroxamate—

$$C.C_7H_5O.C_7H_5O.OK + C_2H_5I = N.C_7H_5O.C_7H_5O.O.C_2H_5 + KI.$$

The ethyl salt is reconverted into hydroxylamine by the action of hydrochloric acid.

A second class of substitution products are not directly formed from hydroxylamine, but by the action of nascent hydrogen on a nitrate, such as ethylnitrate—

$$C_2H_5O.NO_2 + 3H_2 = N.H_2.OC_2H_5 + 2H_2O.$$

A third class are obtained by the action of a chloride on a silver salt of a hydroxamic acid. This compound may be considered as hydroxylamine in which the three hydrogen atoms have been replaced by organic radicals.

Dibenzanishydroxylamine is formed by the action of anisyl chloride on silver dibenzhydroxamate.

$$N.C_7H_5O.C_7H_5O.OAg + C_8H_7O_2.Cl = N.C_7H_5O.C_7H_5O.O.C_8H_7O_2 + AgCl.$$

There are three isomeric bodies having the same formula as dibenzanishydroxylamine, but slightly differing in their reactions with potassium hydrate and hydrochloric acid.

This may be explained by supposing that the different radicals $C_8H_7O_2$ and C_7H_5O take different places in the molecule.

In considering the action of metals upon nitric acid two classes of reactions occur, depending on the metal which is employed.

First, those reactions where nitrates and no hydroxylamine are formed, and secondly, those in which hydroxylamine or ammonia results. Silver and mercury are metals which give rise to the first class of reactions. Silver with nitric acid forms silver nitrite and nitrate, but no hydroxylamine.

$$2Ag + HONO_2 = HO.Ag. + AgNO_2$$
$$\left\{\begin{array}{l} HO.Ag. + HONO_2 = AgO.NO_2 + H_2O \\ AgNO_2 + HONO_2 = AgO.NO_2 + HNO_2 \end{array}\right.$$

The second or zinc-tin class differs from the silver class by forming no nitrite directly from nitric acid, but producing hydroxylamine and ammonia.

When this reaction is utilized for the preparation of hydroxylamine, it is usual to add a second acid, as hydrochloric or sulphuric, but the hydroxylamine is directly eliminated from the nitric acid:—thus

$$7HNO_3 + 3Zn = NH_3O + 2H_2O + 3Zn(NO_3)_2$$

and not indirectly obtained by nascent hydrogen from the action of the second acid on the metal.

The use of the second acid is to set free the nitric acid as soon as it becomes metallic nitrate, and so keep the nitric acid to the end of the operation free to be acted upon. Without the second acid only one-seventh of the nitric acid is converted into hydroxylamine.

When iron is dissolved by nitric acid a large quantity of ammonia is formed, but no hydroxylamine can be detected; this production of ammonia is probably due to a secondary reaction in which hydroxylamine is reduced by the ferrous salt as soon as it is formed.

The paper was fully illustrated by experiments, and a discussion followed in which the Chairman, Secretary, Mr. R. W. Giles, Mr. Joseph Ince, Messrs. Dymond, Elliott and Lowe joined.

A vote of thanks was passed to Mr. Ince.

The Reporter on Inorganic Chemistry, Mr. A. J. G. Lowe, then made two reports on inorganic chemistry. In the first report he drew attention to the white phosphorus of Messrs. Remsen and Keiser (*Chem. News*, xlviii., p. 201), and exhibited a specimen, together with the apparatus by means of which it had been prepared just before the meeting. The apparatus was a flask and receiver containing ice and water, similar to that described by Remsen and Keiser, in which stick phosphorus could be distilled and condensed quickly. A current of carbon dioxide was, however, employed, as on the whole preferable to the hydrogen used by the original experimenters, and the condensed phosphorus, which collected in a thick layer on the surface of the ice and water in the receiver, was a white or yellowish white spongy mass, in appearance between that of flowers of sulphur and phosphoric anhydride. Under the microscope it was seen to consist of minute adhering globules which did not affect polarized light. This distilled phosphorus is light and plastic, and placed in water slightly warm at once melts and assumes the ordinary wax-like condition. It becomes warm and assumes this same condition when dried and exposed to the air. It is not an allotropic modification, but ordinary phosphorus, sublimed and condensed in minute particles. It is thus perfectly analogous to sublimed sulphur. Mr. Lowe therefore suggested that it should be called "sublimed phosphorus" rather than "white phosphorus," which might be thought to imply an allotropic modification.

The second report was upon the "Fluorescence of Iodine Vapour," which had been recently investigated by Lommel (*Wiedemann's Ann.*, 1883, No. 6, p. 356; *Phil. Mag.*, vol. 16, No. 102, p. 463). This was shown experimentally, and it was pointed out that it was the first recorded instance of a fluorescent vapour, and further, that unlike all other cases of fluorescence the refrangibility of the violet and ultra-violet rays was unaffected.

These reports were discussed by the Chairman, Secretary, Mr. R. W. Giles, Mr. Joseph Ince, and also by Messrs. Baily, Elliott and Short.

The Secretary then announced that the Executive Committee had made a grant from the Research Fund to Mr. W. H. Ince in order to defray the expenses connected with his work upon hydroxylamine.

Parliamentary and Law Proceedings.

The Sale of Poisons.

At Newton Abbot Petty Sessions, on Tuesday, J. H. Bibbings, a local chemist, pleaded guilty to a charge of selling prussic acid to a lady without obtaining her signature. The customer, Mrs. Jane Pinsent, obtained the drug about a fortnight ago, on the plea that she was going to kill a dog, but on the following day she poisoned herself. The defendant, who expressed regret for what had occurred, was fined £2.—*Daily Telegraph.*

Fatal Use of Quack Medicine.

An inquest was opened at Moss Bank, near St. Helens, on Wednesday, the 16th, by Mr. W. Hardy, on the body of Samuel Yates, aged nine years, son of John Yates, collier. The lad, it appeared, had enjoyed good health up to the previous Saturday, when he complained of feeling sick. Mrs. Yates gave him some warm tea, but he continued to vomit until noon, when she went to the shop of William Ashall, grocer, and purchased three-pennyworth of "Indian tincture," the whole of which she gave to the boy in warm water and then put him to bed. About six o'clock deceased was breathing heavily, and as she was unable to awaken him she carried him downstairs and laid him across her knee, but he died shortly afterwards. Dr. Anderson, of Billinge, and his assistant, Mr. Nicholson, of Rainford, made a *post-mortem* examination of the body on Tuesday. They stated that the body was that of a healthy lad. All the organs were normal. Having heard the mother's evidence, and judging from the symptoms generally, they were of opinion that death had been caused by some narcotic poison, but what they were not in a position to say. The stomach and a portion of the duodenum had been placed in separate jars, and sent to Dr. Campbell Brown for analysis.

Mrs. Yates said the grocer did not label the glass and did not tell her what was the dose for a child.

Mr. Ashall produced the bottle from which he had supplied Mrs. Yates, on the label of which it was stated: "The only original highly medicated tincture for coughs, colds, bowel complaints, etc. Doses: For adults, one

tablespoonful; ten to fifteen years, half a tablespoonful; seven to ten years, one large teaspoonful; two to seven years, half a teaspoonful, to be taken in warm water or gruel. Now ready to be used everywhere. Admirably adapted for everybody. Calculated to save scores of pounds in doctors' bills. A real boon to the people of this country. Sold here at 3*d.* per ounce." There was no maker's name on the bottle, and Mr. Ashall said it came from Daubhill, near Bolton, but he did not know the name of the man who brought it. He had not told Mrs. Yates what she ought to give the child, thinking she knew, as it was a common medicine. It seemed that six or seven times the proper quantity had been given to the child through the ignorance of the mother.

The inquest was then adjourned until Saturday, and at the adjourned inquest, in answer to the coroner, the police officer said he had made inquiries, and found that the stuff had been supplied by a Mr. Riley, wholesale druggist, Daubhill, near Bolton.

The coroner then told the jury the inquest would have to be adjourned so that the analyst, Dr. Campbell Brown, of Liverpool, might get some indication of the nature of the ingredients of the bottle.

Alleged Poisoning of a Chemist and Druggist.

On Monday, Mr. G. H. Hull, Coroner for the Western Division of Surrey, resumed an adjourned inquiry at Wandsworth Prison, respecting the death of George Robinson, chemist, of Walworth, aged 51, committed for three months' hard labour by the magistrate at Lambeth Police Court for an assault on his wife. The deceased was admited to the gaol on December 19, in pursuance of his sentence, which followed a week's imprisonment in the House of Detention, at Clerkenwell. It was stated that while at the police court he partook of a meat pie and liquid refreshment, which were brought to him, it not being contrary to regulations for friends to supply prisoners with diet while under remand. The man died from arsenical poisoning an hour or two after his admission to Wandsworth Prison, and the evidence of Captain Colville, the Governor of the gaol, was to the effect that when received at half-past five in the evening, the prisoner was very ill indeed, and apparently in great pain. The man could not account for his symptoms, and was treated in the infirmary, where he died.

Dr. Mosse, who was acting for the medical officer of the prison, deposed that he saw the deceased about eight o'clock on the night of December 19. He was then in a state of collapse, and complained of pains in the abdominal region. He was constantly sick, and had frequent diarrhœa; his heart was beating quickly but feebly, and his pulse was barely perceptible. Witness was not present at the time of death. Deceased complained of extreme thirst, and his tongue was dry and parched. He told witness that he was quite well in the morning, and that his symptoms came on at three o'clock in the afternoon. He also said that he was very ill in the van on the way to the prison. Witness ordered him to the infirmary, and he was taken from the cell. A *post-mortem* examination was made four days after death, Dr. Winter, the medical officer to the prison, being present. The body was well nourished. The result of the *post-mortem* was negative—the organs being all healthy excepting the lungs, and there being no apparent cause of death. The stomach contained about three ounces of dark, bilious-looking fluid, which was preserved in a jar and afterwards handed to Professor Stevenson, of Guy's Hospital, for analysis.

Professor Stevenson, deposed that he received a jar containing the stomach of the deceased and the liquid contents. There were no recognizable particles of food in either the stomach or the liquid, and no unusual appearances or signs of disease, except a slight redness of the inner coat of the stomach. From the fluid in the jar he obtained a quantity of arsenic—about a quarter of a grain. It was nearly all in a soluble form, and he could not detect any solid visible particles of arsenic or its compounds. There were also traces of bismuth in the stomach—no doubt given as a medicine, as deposed to by Dr. Mosse. The vomit of the deceased, which consisted of 104 grains of dried matter, contained a white powder, which on analysis, proved to be the subnitrate of bismuth. The vomit also contained arsenic equal to more than one-third of a grain.

By the Coroner.—The arsenic found was only the residue, but no doubt a quantity of the mineral poison was absorbed into the blood or ejected from the system in the vomit and by other means. If a fatal dose had been given, he found as much as he should have expected to find in the body after death. He actually found about half a fatal dose, and it was more than equal to six or even eight medicinal doses. It was not likely that the bismuth contained arsenic as an impurity, and the substance must have been taken or given for the purpose of causing death. He had found no clue as to the form in which the arsenic had been administered. He mentioned this because the sale of such a deadly poison was generally associated with some other compound for the purpose of identification.

The inquiry was then adjourned.—*Times.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Lime Water.

Sir,—The fellowing may be interesting as bearing on the subject of Mr. C. Abraham's letter in your last issue:—In the year 1879, I was engaged to investigate the cause of an unsightly and extensive efflorescence on the bricks of a new public building in the neighbourhood; the incrustation proved to be almost pure sulphate of soda; indeed, a sample of well crystallized "Glauber's salts" prepared from it was sent in with the report, but, for some time, I was unable to point out the source of the soda. The bricks, the clay and the gravel were examined without success, but in the lime both potash and soda were found in the caustic condition; the proportion given in my notes being 0·32 grains caustic soda and 0·3 grains caustic potash in 4 ounces of lime. This is hardly sufficient to account for any appreciable increase in the alkalinity of lime water prepared by the official process, but it is interesting as confirming Mr. Abraham's view as to the presence of caustic alkalies in lime. The proportions, no doubt, differ in different samples.

The Wyle Cop, Shrewsbury. Thos. J. Blunt.

S.Y.—The arrangement of giving an unqualified person an interest in a branch shop would be illegal under the existing law, and should the Pharmacy Bill pass in its present form it will be unlawful to carry on a branch establishment except under the charge of a qualified person.

A.P.S.—We do not agree with you that the "means for attaining so many useful hints is entirely taken away," since the memoranda are all indexed and available for reference. The dose of hydrogen peroxide (10 vols.) that has been recommended is one-half to two drachms.

Associate.—We are not aware that such a photograph has been taken.

Anon.—An indiarubber cement, suitable for fastening the tyres on bicycle wheels, may be made by digesting during three or four weeks with frequent agitation 1 part of shellac in 10 parts of liq. ammon. fort. in a wide-mouthed bottle, placed in a warm spot. The mixture first forms a transparent mass and then becomes liquid.

J. E. L.—You are recommended, to test the iodine used.

W. Wilkinson.—We understand that the subject is already being inquired into and therefore defer the publication of your letter for the present.

A. B.—We do not remember the experiments. Are you thinking of Professor Tyndall's paper on the "Conversion of Radiant Heat into Sound"? (See *P. J.*, [3], xii., 628).

Communications, Letters, etc., have been received from Messrs. Burchell, Cock, Dispenser, J. E. L., N. B., A. P. S., T. G. R.

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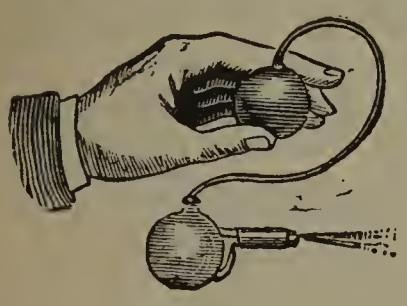

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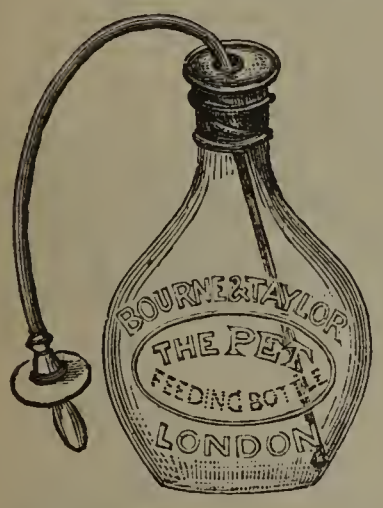

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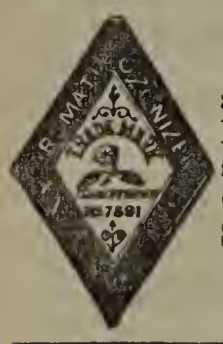

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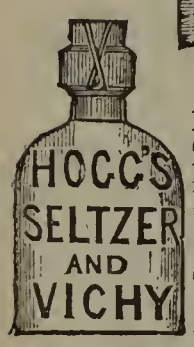

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See Chemist and Druggist, January last, page 33.

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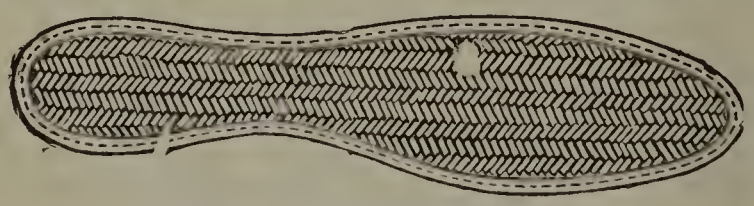

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FOURTEENTH SESSION, 1883-4.

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Containing all the digestive principles of the fresh pancreas. Used to prepare peptonised or partially digested food (no special apparatus required), and also medicinally as a digestive. In 4, 8, and 16 ounce Bottles, to retail at 2/6, 4/6, and 8/6.

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PHARMACEUTICAL CHEMISTS, MANCHESTER.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 710.] SATURDAY, FEBRUARY 2, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

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The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, February 6th.

The Chair will be taken at half-past Eight *precisely*.

The following papers will be read :

"Report upon the Pharmaceutical Preparations of Nux Vomica" (*continued*).

By WYNDHAM R. DUNSTAN and FREDK. WM. SHORT.

IV. "The Preparation of a Standard Extract of Nux Vomica."

V. "The Preparation of a Standard Tincture of Nux Vomica."

"On the Assay of Atropa Belladonna."

By WYNDHAM R. DUNSTAN and FRANCIS RANSOM.

I. "The Estimation of the Alkaloids in the Root of Atropa Belladonna."

"On a sample of Sophisticated Oil of Turpentine."

By BOVERTON REDWOOD, F.C.S.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

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Cheques and post office orders to be made payable to ELIAS BREMRIDGE.

Special Notice to Advertisers.—See page iii.

NOW READY.

Price 1s., or post free 1s. 5½d.

The Calendar of the Pharmaceutical Society

FOR 1884.

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Now in the Press and will shortly be ready, price 5s., or post free, 5s. 7d.

THE REGISTER OF Pharmaceutical Chemists and Chemists and Druggists

FOR 1884.

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A new feature in this number is a list with an index of produce received and examined.

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JUNIOR PHARMACY BALL

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AT WILLIS'S ROOMS.

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IMPORTANT NOTICE TO ADVERTISERS.

SPECIAL ISSUE OF THE

Pharmaceutical Journal

ON FEBRUARY 23, 1884.

The Council of the Pharmaceutical Society has ordered to be published in the Journal of February 23, in addition to the usual contents, a detailed list of

SUBSCRIBERS TO THE BENEVOLENT FUND

In the hope of awakening greater interest in this Fund, the benefits of which are extended to the **ENTIRE TRADE.** With this object, the

PHARMACEUTICAL JOURNAL OF FEBRUARY 23

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EVERY CHEMIST AND DRUGGIST

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GUARANTEED CIRCULATION

OF NEARLY

16,000 COPIES

Of this Number, and as it will be sent to

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Advertisements for the Special Issue should be sent without delay to the Publishers,

J. & A. CHURCHILL, 11, New Burlington St., London, W.

N.B.—An Index to the Advertisements, for the purpose of facilitating reference, will be given.

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The most powerful agent for the digestion of Meat, Milk, Eggs, &c.

May be taken with Food as a Sauce or Ketchup.

These preparations are reliable and concentrated forms adapted for all the purposes for which Pancreatine and Pepsine are administered. Dose, 1 drachm. (See *British Medical Journal*, Dec. 13, 1879, p. 965, &c.)

PEPSINE ELIXIR

(Acid Glycerole of Pepsine).

A convenient solution for admixture with other remedies, as Iron, Bismuth, &c., its syrupy nature rendering it easily miscible with other syrups and aqueous fluids.

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These Preparations are obtainable in 4, 8 and 16 oz. Bottles, or any quantity required, of all Wholesale and Retail Chemists, &c.

NUTRITIVE, OR MIXED PEPTONE ENEMA

(ENEMA PEPTONICUM, SAVORY),

Consisting of mixed Peptonised Foods for injection per Rectum, thus supplementing and relieving the Digestive Organs. Prepared at the suggestion of A. E. SANSOM, Esq., M.D., &c.

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Are combinations of FRY'S PURE COCOA EXTRACT and CHOCOLATE PASTE with ALLEN & HANBURYS' CONCENTRATED EXTRACT of MALT, affording delicious beverages. The Extract may be most agreeably taken in either of these forms. Sold in tins at 1s. and 2s. each, 9s. and 18s. per dozen. The COCOA is in the form of Powder, the CHOCOLATE of PASTE, and sweetened.

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No. 1, to make	700	doz.	Botts.	per	day	...	£70	0 0
No. 2, „	500	„	„	„		...	65	0 0
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These are the same for any size Machine.

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The above quantities are for Lemonade and other Saccharine Drinks; if for Splits, reckon double; if for a very highly charged Soda Water, reckon half.

These Machines are all packed without taking apart, and can be set to work immediately on arrival. Many of these Machines have been in constant use for forty years without requiring any repairs. Recipes and every information given for manufacturing all the above Drinks, so that the most inexperienced can at once produce Waters of the highest class. **Inventors of Fruit Champagne. Sample Case, containing 1 dozen, forwarded for 6s. 6d.**

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The high reputation this bottle has achieved is due to the fact of its being in every particular the most perfect yet introduced, and when compared with others in the market it stands pre-eminent. It is the most simple in its working parts, therefore the least liable to get out of order; it is the most easily opened, the lightest pressure on the handle being sufficient; it produces a more highly charged gaseous water than is usually obtained from syphons; it compares most favourably in appearance with any, and the metal top being entirely free from lead, the prejudice against syphon drinks is at once removed, as the liquid passes over pure tin only.

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REDUCED PRICES!!

7 lb. Tins	per lb.	5/11	each	41/5
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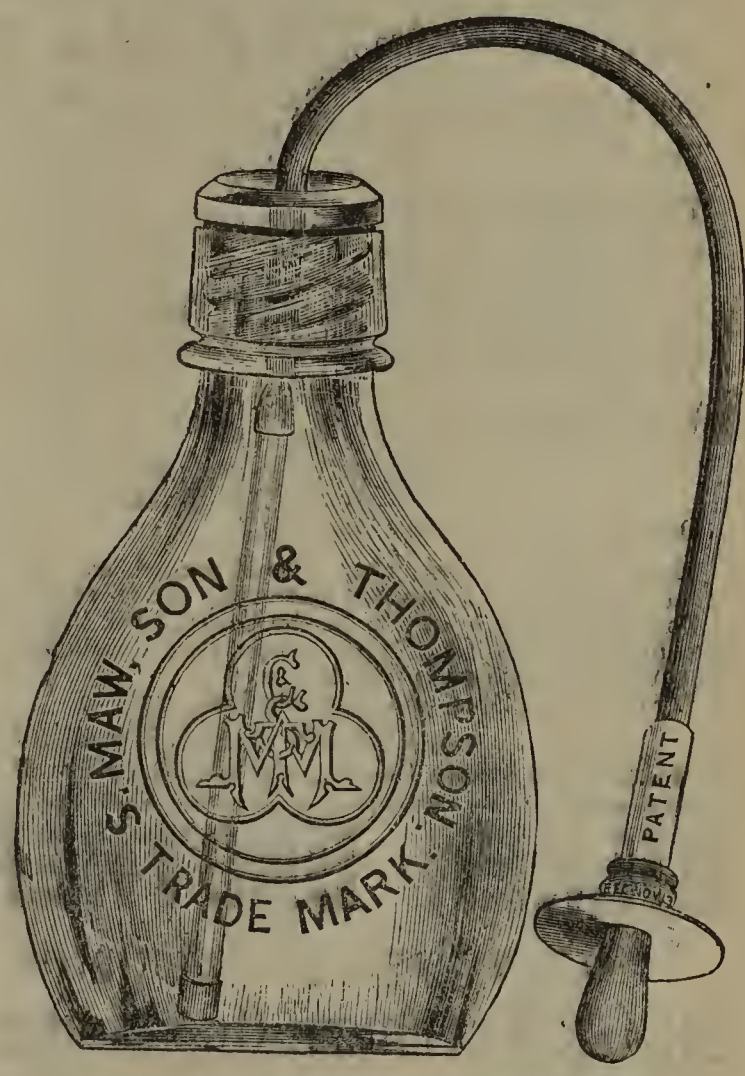

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Export, Earthenware Caps - - „	—	7/3	—	—	8/3	—
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FOR FURTHER PARTICULARS SEE QUARTERLY PRICE CURRENT, pages 69 and 70.

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The LONDON 2/6 TEA For Retail at 2/6.	.. ..	55 ,,
The LONDON ASSAM BROKEN TEA For Retail at 2/8.	..	16 ,,
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Invite the attention of Chemists and others to the large variety of Glass Bottles, &c., that they supply, and solicit orders for same.

DISPENSING.—Green and White Flint, of all sizes and shapes.

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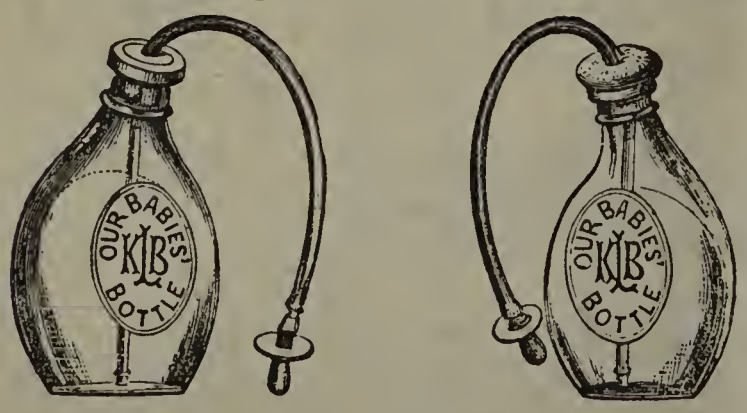
FEEDING BOTTLES.—"Our Babies' Bottle," in Green and White Glass, with white, brown or black fittings.



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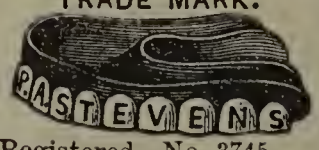
TRADE MARK. 

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As supplied to Bass & Co., and the leading Brewers and Bottlers of Wines and Spirits throughout Europe.

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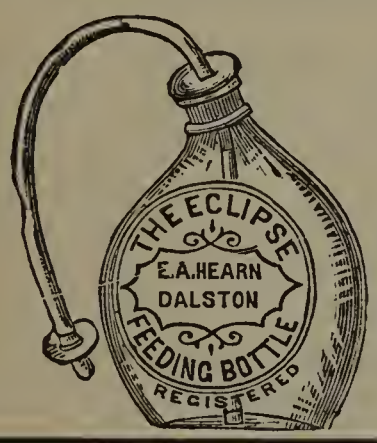

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GLASS BOTTLES of EVERY DESCRIPTION, either PLAIN or STOPPERED, made in WHITE, BLUE, AMBER, ACTINIC GREEN, or any other colour required.

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"OUR LITTLE PETS" FEEDING BOTTLE

Fitted with Best Glazed Earthenware Caps.

Each Bottle, with two Brushes, put in Handsome Cardboard Box, bearing our Copyright Label.

White Fittings, **84/-** per gross.
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DOG MEDICINES AND SOAP

TASTELESS APERIENT BISCUIT FOR DOGS.

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CURES ALL KINDS OF CUTS, BRUISES AND WOUNDS IN MAN AND ANIMALS.

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4s. 6d. and 10s. 6d.

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THE LAUNDRESS' TRUE FRIEND.

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Dandelion Antibilious Pills

Price 1s. 1½d. and 2s. 9d. per Box.

Registered.] **TARAX. AND PODOPH.** [*Registered.*

A NON-MERCURIAL LIVER MEDICINE, specially useful to the habitually constipated, and safe for all ages.

Earnest caution needed against injurious imitations. Worthy of trade notice. Reliable, and rapidly increasing in public acceptance.

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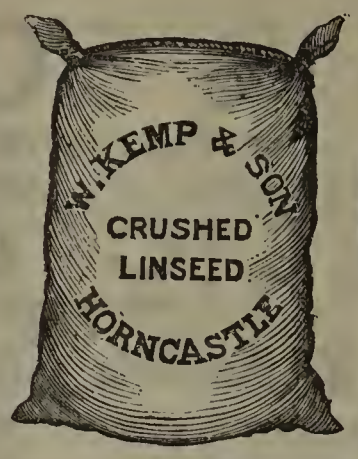
TO BE HAD OF THE USUAL HOUSES AT HOME AND ABROAD.



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CONTAINING ALL THE OIL.

Nothing better can be obtained.

IN FREE 1 cwt. BAGS, 18s. 6d. cwt.

Special Quotations for 5 cwts. and upwards.

W. KEMP & SON, Horncastle.

Linseed Meal, without Oil, 11s. 6d. cwt., bag free.

London Agents — Messrs. Barclay & Sons, 95, Farringdon Street, who hold stock and supply 1 cwt. bags at above price; smaller lots 20/- cwt.

PURE SPIRITS OF WINE.

TO WHOLESALE DRUGGISTS, CHEMISTS, PERFUMERS, &c.

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METHYLATED SPIRIT AND FINISH,
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We are selling the above at the lowest possible cash price of the day, in quantities of Five Gallons and upwards. Quotations upon application.

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CATALONIAN SHERRY

7*s.* 6*d.* per gallon. A good sound wine, combining body and strength, and specially adapted for medicated wines and other purposes.

ORANGE WINE, finest quality; guaranteed not to cause a deposit or become opaque by the addition of quinine. 6*s.* per gallon, net. cash.

BOWERBANK'S CELEBRATED PURE SPIRIT OF WINE

Is used by all the principal Wholesale Druggists, Pharmaceutists and Perfumers in town and country (54° to 65°), and will bear testing with Ammonia. It is allowed to be the best article out for making Tinctures, Essences, and the most delicate Perfumes, being perfectly free from smell and Füsil Oil. Can be obtained through Druggists with E. B. and Sons' name and label on bottles, &c.

Packages to be paid for and allowed upon return.

BISHOPSGATE DISTILLERY,

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Also at DUNNING'S ALLEY and 1, LAMB ALLEY.

N.B.—No connection with the House styled Bishopsgate Distillery and Wine Company.

ESTABLISHED 1782.

CHEQUES—THE LONDON AND WESTMINSTER BANK.

Æsculap

BITTER WATER COMPANY, LIMITED

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LONDON, E.C.

SIR,

IN order to keep before the Medical and Pharmaceutical Professions the latest authentic researches with regard to Natural Mineral Waters, I beg to call your attention to the following references which have appeared since the issue of the pamphlet on "Æsculap."

In Dr. Sydney Ringer's "HANDBOOK OF THERAPEUTICS," 10th edition 1883, p. 220, is the following:—

"An excellent way to administer some of these Salts (Sulphate of Soda and "Magnesia) is in the form of . . . . . .

"BEST OF ALL, ÆSCULAP WATER,

"in doses varying from a wine-glassful to half a tumblerful or more."

In "THE MINERAL WATERS OF EUROPE," 1883, by Professor Tichborne and Dr. Prosser James, ÆSCULAP BITTER WATER is placed at the head of Class I. of Strong Purgatives (p. 214), as it is—

"The chief of the 'Ofen' Group . . . . . .
"A mixed purgative, with well-marked antacid reactions . . . . . .
"three times as rich in antacids . . . . . .
"contains nearly three times as much Chloride of Sodium . . . . . .
"not so unpleasant to take . . . . . .
"and is free from organic impurity." . . . . . .

Great weight is attached to the modifying effects of the Antacids and Chloride of Sodium, as—

"These two Salts are admirably suited to reinforce the Sulphates, and the "Mineral Waters thus constituted are remarkable for their efficacy as well "as for their mildness."

I shall be glad to forward you a supply of circulars, descriptive pamphlets, and copies of testimonials, show-cards, &c., free of charge, on application.

I remain, Sir, yours obediently,

E. SAMSON, *Manager.*

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"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

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THE LANCET says of the Kepler Extract of Malt: "The best known, and in this country the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil." And further adds, "It is very good, and may be used with confidence."

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An important improvement has been made, which now renders the most offensive and repulsive drugs easy of administration. This improvement consists in perfectly sealing with a thin transparent capsule of gelatine all drugs such as quinine, morphia, rhubarb, &c., also the various pills and powders of the Pharmacopœia. These capsules are of an ovoid shape, and it has been demonstrated beyond question that when ordinary coated pills are rejected by patients there is not the slightest difficulty in administering this new form.

Kepler Cod-Liver Oil with Extract of Malt.

This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

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"This is a really valuable preparation, and, as far as we know, a novelty. It contains beef-juice and citrate of iron in solution in wine, and is therefore a very powerful and rapidly-acting tonic. Children, as well as adults, take it easily; and, as its taste is by no means unpleasant, it can hardly fail to attain great popularity."

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Hazeline is distilled from the fresh green inner bark of Hamamelis Virginica, the American Witch Hazel. It represents, in a concentrated form, all the active principles of the plant. It is a clear, colourless fluid, having a fragrant, agreeable odour, and slightly astringent taste. Does not stain linen, and is entirely free from toxic or irritating properties.

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EXACT SIZE OF TABLET.

Of Chlorate of Potash and other drugs usually employed for throat affections. Chlorate of Potash with Borax; Chlorate of Potash with Chloride of Ammonium; Chloride of Ammonium with Borax, &c. The pure drug, without any addition, is compressed in very small lenticular discs, which are easily retained in the mouth while singing or speaking. The great advantage of these Tablets over the ordinary lozenges is, that they are free from the irritating saccharine matter with which ordinary lozenges are diluted. They are now almost universally prescribed by the profession in preference to the usual gargles, for when allowed to dissolve in the mouth the saliva becomes charged with the salt, carrying it directly to the affected parts, thus really securing all the beneficial effects of a continuous gargle without the injurious exertion which was required by the old method. Supplied in Packages at 1s., 2s. and 3s.

The Wyeth Soluble Compressed Hypodermic Tablets.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
Morphiæ Sulphas ....1-4 grain.	Atropiæ Sulphas .... 1-200 grain.
Morphiæ Sulphas ....1-6 grain.	Morphiæ Sulphas ....1-12 grain
Morphiæ Sulphas ....1-8 grain.	Atropiæ Sulphas ....1-250 grain.
Morphiæ Sulphas ....1-12 grain.	Atropiæ Sulphas ....1-60 grain.
Morphiæ Sulphas ....1-3 grain.	Atropiæ Sulphas ....1-100 grain.
Atropiæ Sulphas ....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
Morphiæ Sulphas ....1-4 grain.	Strychniæ Sulphas ..1-60 grain.
Atropiæ Sulphas ....1-150 grain.	Strychniæ Sulphas ..1-100 grain.
Morphiæ Sulphas ....1-6 grain.	Strychniæ Sulphas ..1-150 grain.
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1. It is easily administered, the dose being very small.
2. It has no unpleasant taste or smell.
3. It does not irritate the stomach.
4. It has no effect on the bowels, producing neither constipation nor diarrhœa.
5. It does not blacken the teeth.

In ordering please specify Fer. Wyeth 3 oz. with Dropper.

NOTE.

All the articles mentioned on this page may be obtained from respectable Dispensing Chemists and Wholesale Druggists in every part of the world, or from the European Depôt of Burroughs, Wellcome & Co., Snow Hill Buildings, London, E.C. Our new Formulæ Book and Trial Specimens of any of our Preparations will be sent to any Member of the Profession upon request.

Burroughs Wellcome & Co., Manufacturing Chemists,

SNOW HILL BUILDINGS, LONDON, E.C.

"THE MONTH."

At the drug sales this month an unusually large quantity of assafœtida was offered and some very fine "Socotrine" aloes. The Socotrine aloes above alluded to came in small tin dishes and in small white saucers, in which the juice had apparently been poured to solidify it. On account of the bad quality of this drug in recent years the cultivation of the aloe yielding it is deserving of the attention of planters in the colonies, especially since the plant (*Aloe Perryi*) has been brought to Kew Gardens by Professor J. B. Balfour and there can be no great difficulty in obtaining it for cultivation. There was also exposed for sale a large white-looking variety of jalap from Mexico, which bore some resemblance to what has been described as stalk jalap (*Ipomœa Orizabensis*). A root was also offered (apparently from the west of Africa) under the name of pareira brava root, which resembled the genuine article in the black colour of the exterior surface, but was evidently not the root of *Chondrodendron tomentosum*, the concentric rings being narrower and of much more dense structure. This false pareira brava was offered without reserve and there were 164 "pockets" of it for sale. It was bought at a low price by one or two firms, and may, therefore, be expected to be met with in retail commerce. It was interesting also to note among the drugs offered for sale "Syrian" cummin seed, showing that cummin is still an article of commerce in that country as it was in the times of the Evangelists. There were also a number of Brazilian drugs, including one not observed before, "tinguasseba" bark (*Xanthoxylum Tinguaciba*, St. Hil.), which is used in Brazil for intermittent fevers. Some bark of the balsam of peru tree from which the balsam had been prepared was put up for sale, but for what purpose it was imported did not appear.

The unusually fine and mild weather of the last few weeks has in many places caused a most precocious development of vegetation. The coltsfoot was seen in blossom on December 30, wild primroses were sold in the streets early in the month, and the roses are already putting forth green leaves in the gardens. In a list of plants given in *Nature* (January 10, p. 236), to call attention to the mildness of the season, there are mentioned among others *Centaurea Scabiosa*, *Achillea Millefolium*, *Pimpinella Saxifraga*, *Pastinaca sativa* and *Rumex crispus*. These were gathered on December 24 and 26, in the neighbourhood of Bath and Bradford-on-Avon. A correspondent at Reigate forwarded on January 14 a box full of blossoms of *Chrysanthemum segetum*, gathered in a turnip field. Another correspondent writes this week that in the neighbourhood of Poole the catkins of the willows are open and camellias are in full bloom out of doors, and on all sides there are reports of plants in blossom which are rarely seen in that condition in January. It is quite possible, however, that this may not be the case in sandy or dry soils, since the Kew Gardens do not present signs of unusually early vegetation. The Christmas rose, *Helleborus niger*, is in full bloom and the bearsfoot (*Helleborus fœtidus*) is already in bud; but the mezereon does not appear as yet to have opened its flower buds, and neither the Jeffersonia nor Sanguinaria, both early flowers, have made any start. In the Economic House the nutmeg is coming into flower, and the *Olea fragrans* perfumes the whole compartment with its delicate odour.

At the meeting of the Linnean Society held on January 17, Mr. J. G. Baker read a paper on the tuberous species of *Solanum*. There have been about nine hundred species described as belonging to the genus, which, however, Bentham and Hooker could reduce to about seven hundred. Only a very small proportion of these have tuberous underground stems; this section including, according to M. Dunal's monograph in De Candolle's 'Prodromus,' twenty species, all natives of the South American continent, and as far north as Mexico and Texas. These twenty species Mr. Baker thinks should be reduced to six, with well-marked specific characters. While from a botanical point of view the range of *Solanum tuberosum* has thus been unduly narrowed by separating from it forms which are not specifically distinct; from a popular point of view it has, on the other hand, been erroneously extended, from the fact that the late Mr. Darwin, in his 'Voyage of the *Beagle*,' described the potato as growing as far south as 50° S. lat. But Mr. Baker has clearly determined that the species gathered there by Mr. Darwin is not *Solanum tuberosum*, but a quite distinct species, *S. Maglia*. The geographical range of the true *S. tuberosum* extends from Chili to Mexico, though it is doubtful to what extent it is native in the equatorial regions, having been cultivated from time immemorial by the Indians. Besides *S. Maglia*, the most important of the tuberous species are *S. Commersoni*, widely dispersed through Uruguay and Paraguay, and *S. Jamesii*, a native of New Mexico. The tubers of the latter species are, however, very small, not much larger than a hazel-nut. The remaining species are but little known, and probably are of no economic value. The only one ever cultivated in Europe is *S. Maglia*, which was at one time grown at Chiswick by Mr. Sabine, but has long gone out of cultivation. By a visit to the establishment of Messrs. Sutton at Reading, Mr. Baker satisfied himself that all the potatoes grown in this country are varieties of *S. tuberosum*. As regards any practical hints to potato growers, Mr. Baker pointed out that the whole energy of cultivators has been thrown into the production of the tuber at the expense of the flower and seed, a proceeding which cannot fail ultimately to decrease the vigour of the plant, and render it an easy prey to the attacks of enemies, animal or vegetable. The early spring varieties now never flower. An experiment of Andrew Knight's demonstrated that if the tubers are removed, or the supply of food to them restricted, the plant at once commences to flower. It would be quite worth while for potato growers to turn their attention to the cultivation of others of the American tuberous species, especially *S. Maglia* and *Commersoni*. The former in particular, coming from Southern Chili, would appear to be especially adapted for cultivation in Scotland and Ireland, its native country being much more rainy than that of *S. tuberosum*. Hybridizing might also be tried with advantage. The annual value of the potato crop in the British Isles Mr. Baker estimates at not less than £20,000,000.

On December 17, Professor Dickson read a paper before the Royal Society of Edinburgh, "On the Structure of the Seedling Pitcher of Nepenthes." He has found that there is a row of button or cushion-shaped glands just within the inflexed edge of the rim of the pitcher, and in the adult plant he has discovered just above the free edge of the inflexed rim

a single line of orifices alternating with the ridges of the rim. Each of these proved, on dissection, to be the opening of a canal-like furrow, from the base of which a cellular nipple-shaped gland, or rather the apex of one, projects, the bulk of the gland being immersed in the substance of the rim. The glands vary in length, according to the species, from $\frac{1}{37}$ (*N. ampullaria*) to $\frac{1}{12}$ of an inch (*N. distillatoria*, *N. phyllamphora*). These glands are believed by Professor Dickson to secrete honey.

In the *Journal of Botany* for this month, Mr. H. Groves gives an illustration and description of the new British *Chara*, *C. Braunii*, Gm., which was discovered by Mr. C. Bailey, near Reddish, Lancashire. In the same journal Mr. F. Townsend has some interesting remarks on *Erythræa capitata*, Willd, var. *sphærocephala*, Towns., showing that the flowers are evidently proterogynous, and that in consequence of the exterior surface of the petals of the unopened flowers being of a brighter colour than the interior at the time when the stigma is protruded, the colour of them attracts insects, so that cross-fertilization is ensured. After fertilization the corolla grows longer so as to enclose the stigma, and the anthers are protected until they have matured.

Mr. C. Woolley Dod, in the *Gardeners' Chronicle* (Jan. 19, p. 90), has pointed out a curious habit in one of our rare British plants, *Lithospermum purpuro-cæruleum*. He has observed it on limestone rocks in the Vale of Clwyd, Denbighshire, where he noticed that the terminal tufts of leaves at the apex of the shoots put forth roots which, when the arched stem touched the ground late in the year, entered the ground and formed new plants, the connecting stem decaying and ultimately disappearing. The same habit has been observed in another rare British plant, *Scirpus Holoschœnus*, in which the roots are given off at the base of the inflorescence. It may also be commonly observed in brambles, but does not appear to have been previously recorded concerning the *Lithospermum*, which, at least in Devonshire, ripens its fruit freely. It would be interesting to know if this be the case also in Denbighshire.

Mr. W. Watson, in the same journal, gives an account of the germination of the *Nymphæa*, with an illustration exhibiting the curious pseudo-endogenous character of the embryo and germination, which taken in conjunction with the endogenous structure of the rhizome and the hydrocharoid habit of the plant has led to the genus being referred by some authors to the *Endogenæ*. Mr. Watson shows that although one group of species open at night and another during the day this is not affected by reversing the conditions, those which open during the night doing so even in brilliant gas light, but refusing to open during the day when kept in total darkness. He finds also that the pollen will sink in water, and is therefore not likely to be floated away from the flowers.

A very pretty little marsileacean plant from Carolina, *Azolla Caroliniana*, has recently become naturalized in a large pond near Pinner, Middlesex, in which it overrides the duckweed; it is also spreading on other ponds of the neighbourhood, apparently having originated from private gardens close by ('Science Gossip,' Dec., p. 279).

M. C. Naudin furnishes an interesting account (*Annales Sc. Nat.*, [6], vol. xvi., p. 337) of the species of *Eucalyptus* introduced into the Mediterranean region, and more particularly of those which have arrived at the adult stage in France and Algeria, thirty years having now elapsed since the culture of the species of this genus was commenced in France. He states that so far as regards production in timber alone the *E. globulus* has four times the value of the oak tree, since the growth of twenty-five years equals that of an oak of one hundred. By cutting down the trees in the winter, when the wood has the least sap in it, the tendency of the wood to split is avoided. He makes the suggestion that in the future a residence in the *Eucalyptus* groves of Algeria may become a part of the treatment prescribed to sufferers from phthisis. The astringent bark of the tree, which is shed naturally and thus has an advantage over such as are obtained only by the destruction of the tree, might, he believes, be used in the manufacture of leather. Owing to the rapid growth of the tree it is also likely to prove of great value as firewood, which, in France, is an important consideration. *E. melliodora* he considers not only valuable as a decorative tree, but also for the bee-keeper, on account of the abundance of fragrant flowers which it bears.

Chlorophyll has been the subject of a considerable number of investigations, but the problem of its nature and constitution remains at present far from being solved. Dr. Schunck, attacking the question from the chemical side, has in a communication to the Royal Society made known his reasons (*Chem. News*, xlv., 5) for supposing that it is a glucoside, resembling in this respect certain other colouring matters that occur ready formed and in a free state in vegetable organisms, such as those of turmeric and safflower. The greatest obstacle in deciding this point has been the difficulty experienced in obtaining pure chlorophyll, Dr. Schunck considering the so-called "crystallized chlorophyll" to be really a decomposition product. The process followed was to extract spinach leaves with boiling alcohol, filter off the deposit that formed after a time and mix with the tincture an equal volume of ether and about two volumes of water. Upon standing the liquid separated into two layers, the upper one green and containing all the chlorophyll, the lower bright yellow and containing colouring matter and a substance reducing Fehling's solution. The upper layer was separated, a little fresh ether added, and again washed with water, the process being repeated until the fresh lower layer ceased to give the glucose reaction. The upper layer then left upon evaporation a bright green residue, which although not pure chlorophyll was free from all matter soluble in water. This residue treated in the cold with concentrated sulphuric acid formed a green solution, which after standing some time gave on the addition of water a dark green precipitate, consisting essentially of the phyllocyanin and phylloxanthin of Fremy, whilst the filtered liquid gave the glucose reaction. Dr. Schunck therefore infers that the green leaves of all plants contain a glucoside, insoluble in water, but soluble in alcohol and ether, and that this is probably chlorophyll.

The separation of digitalin and the bodies which accompany it in *Digitalis purpurea* has been the subject of many communications. The method usually followed in Germany depends upon digitalin being precipitable by tannic acid, whilst the French method is based upon digitalin and digitin being thrown down by water from an alco-

holic extract of the plant, the digitalein, being easily soluble in water, remaining in solution. Herr Palm recommends (*Zeits. anal. Chemie*, xxiii., 22) a process for the separation and quantitative determination of digitalin, digitalein and digitin, which consists in treating an aqueous extract of the plant that has been completely decolorized by repeated filtration through animal charcoal with a solution of lead acetate and alcoholic ammonia, then making the precipitate, which consists of the glucosides in combination with lead oxide, into a thin paste with water, and decomposing it by means of sulphuretted hydrogen. Upon filtration the digitalein passes into the aqueous filtrate; whilst the digitalin can be removed from the residue on the filter by treatment with chloroform and the digitin by means of alcohol. Picrotoxin and solanin are also thrown down under similar conditions; but whilst the digitalin precipitate is gelatinous and becomes flesh-coloured upon the addition of concentrated sulphuric acid, a picrotoxin precipitate is more slimy and coloured saffron yellow by sulphuric acid, and a solanin precipitate is sandy, and with sugar and sulphuric acid becomes first violet and then blue.

"Cascara amarga," also known in commerce as "Honduras bark," obtained from a tree indigenous to Mexico, has been submitted to examination by Mr. Thompson in the laboratory of Messrs. Parke, Davis and Co. He reports (*Ther. Gazette*, v., 8) that he has isolated from it a crystalline alkaloidal substance, which is freely soluble in chloroform, less soluble in ether and benzine and insoluble in dilute acids and fixed alkalies. Only amorphous salts of this substance were obtained, which were freely soluble in water, but insoluble in chloroform or ether. As the plant yielding the bark is supposed to belong to the genus *Picramnia*, it is proposed that the alkaloid, of which the yield is about 3 per cent., should be named "picramnine."

Dr. Hesse has been engaged upon an exhaustive investigation of the derivatives obtained from morphine by treatment of the base with acid anhydrides, using acetic and propionic anhydrides. He reports (*Annalen*, ccxxii., 203), that his experiments show that in morphine there are only two atoms of hydrogen which can be replaced by radicals of the fatty acid series,—such as acetyl or propionyl,—thus confirming previous statements that the base contains only two hydroxyl groups. But these two hydroxyl groups do not both stand in the same relation to the morphine, the hydrogen of one of them being replaceable by an acid radical and the other either by an acid or an alcohol radical It is to the latter hydroxyl that the phenol-like character of morphine is attributable.

In the new periodical, *The Asclepiad* (p. 91), there is an illustrated description of Mr. A. W. Blyth's cochineal test for lead in water. This consists in adding ten drops of a one per cent. solution of cochineal in proof spirit to an ounce of the suspected water, placed in a white porcelain dish. If the water be free from lead the cochineal colour will remain unaffected, but if it contain one part of lead in seven hundred thousand it will be changed to a purple pink, whilst with one part of lead in seventy thousand it will become purple blue. By a slip in the text one grain in ten gallons is represented as equal to one part in seven hundred.

The sophistication of quinine sulphate with a cinchonine salt, which occurred some time ago in Paris, has occasioned the issue by the French War Department of an official test for the purity of the samples of quinine sulphate that may be submitted to that department, and the test is an exemplification of the truism that a little knowledge is a dangerous thing. Among the nine tests that are given it is required that the sample shall be white, homogeneous and crystalline; and that when calcined it shall not leave a residue exceeding 25 centigrams per 100 grams (that is, 0·25 per cent.). It should not contain any quinidine, salicin or other foreign matters; its aqueous solution should be perfectly clear and alkaline to test-paper; moreover, it should consist of quinine, 76·25; sulphuric acid, 9·42; water driven off at 100°, 12·00; water combined at 100°, 2·33. Finally, the quantity of cinchonine admitted by tolerance should not exceed "two-hundredths." Apart from the other singularities in these requirements, no mention is made of cinchonidine, the alkaloid commonly occurring in samples of commercial quinine sulphate, and it is difficult to understand the reason of fixing the limit of water at 12 per cent.

According to Dr Hager (*Ph. Central.*, xxiv., 570), benzoate of soda prepared from "resin benzoic acid" (*i.e.* benzoic acid prepared from resin by the wet process) is said to be more active than the benzoate prepared from artificial acid. As a means to distinguish between the two, he recommends to dissolve 0·1 gram of the benzoate of sodium in 10 c.c. of water and add to the solution 20 drops of solution of potassium permanganate (presumably the P.G. volumetric solution, 1 gram in a litre). The resin benzoate causes no change of colour within an hour, whilst with the "artificial" benzoate the permanganate undergoes reduction within half an hour. The assumption that the term "resin acid" indicated the sublimed acid, which Dr. Hager says is incorrect, has given rise to some criticism of this test, marked by the acrimony that appears to be inseparable just now in Germany from any discussion referring to the action of potassium permanganate upon benzoic acid.

In a pamphlet issued by Messrs. Schering, of Berlin, which contains an interesting account of the experiments made by Dr. Cervello and others with paraldehyd, some surprise is expressed that notwithstanding the results obtained with this compound as a hypnotic it has not yet come more widely into use. This, it is thought probable, is due to some extent to the unfavourable impression caused sometimes by the use of an impure article, and mention is made of a preparation, labelled "pure paraldehyd," which not only contained acetaldehyd, boiling at 20° C., but was contaminated also with the poisonous amylaldehyd. The characters of pure paraldehyd, as given in this pamphlet, are that it should have a specific gravity of 0·998 at 15° C., boil at 124° C., solidify at 10° C., mix in all proportions with alcohol and ether and with 10 parts of water at 15° C. On account of its complete solubility in water, paraldehyd is said to be most conveniently administered in aqueous solution, with an addition of a suitable syrup.

A considerable amount of attention has been paid recently to the preparation of a "tasteless tannate of quinine," but a series of experiments made by Mr. C. E. Field (*Pharm. Record*, iv., 5), using solvents representing the gastric juice, as well as gastric juice obtained from a dog, have led him to the conclusion that as a remedy representing quinine the tannate

is comparatively valueless in consequence of its insolubility. Further, when given to adults in doses of ten grains it failed to produce the usual effects of quinine.

In a paper contributed to the New York *Medical News*, Dr. Da Costa has published the result of observations made by him, following the administration of some salts of nickel in the treatment of certain nervous diseases, and has recommended the use of a syrup of nickel bromide. According to Mr. Genois (*Pharm. Record*, iv., 5) this syrup can be conveniently prepared by the direct combination of the elements and the addition of sugar to the solution obtained. He gives a formula for preparing it of a strength corresponding to five grains of the salt in each teaspoonful, which consists in mixing together 468 grains of bromine, 172 grains of granulated zinc and 16 fluid ounces of water, promoting the reaction by the aid of a very gentle heat, when it is completed adding 25 troy ounces of sugar, and after straining mixing with sufficient syrup to measure a quart.

In the *British Medical Journal* (Jan. 19, p. 103) Dr. G. C. Kingsbury recommends the use of chloral for persistent hiccough, a dose of 30 grains having proved sufficient to stop the hiccough after the patient had suffered incessantly from it for twelve days.

A few years ago Dr. Luton, of Rheims, stated that strychnia is the antidote for alcoholic intoxication, and that the presence of strychnia in alcoholic drink ought to be authorized by the Government. M. Dujardin Beaumetz contributed some interesting remarks on this subject at a meeting of the French Temperance Society, in which it was stated that strychnia had been found to combat the symptoms of drunkenness and also of acute delirium, but that it does not at all prevent or modify the condition of the organs injured by excessive drinking of alcohol (*Brit. Med. Journ.*, Jan. 19, p. 132).

It was lately proposed by M. A. Gerard, at the Academy of Sciences, to destroy by means of sulphuric acid the bodies of animals dying of virulent diseases; but M. Regnard (*Revue Medicale*, Dec. 1) now points out how easily bodies might be made away with by means of a liquid so readily procurable, and suggests that some restriction should be placed upon its sale. His experiments on dead newly born infants showed that the body entirely disappeared when digested with twice its weight of commercial sulphuric acid for twenty-six or thirty hours, leaving no trace except the presence of some fat, phosphoric acid and nitrogen (*Med. Times*, Jan. 5, p. 32). It by no means follows, however, that the bony structure of an adult would leave no traces or would dissolve so easily, as seems to be taken for granted.

Although numerous remedies have been proposed from time to time for the cure of hydrophobia, hardly any of them appear to have been the object of careful physiological experiment. Some months ago Professor Bouley communicated to the Academy of Medicine of Paris a case in which hydrophobia had been apparently cured by the administration of pilocarpine. The use of garlic in the same disease has also recently been revived. M. Gibier, desirous of ascertaining whether these drugs were of any real value, has submitted them to the test of careful experiments (*Comptes Rendus*, xcviii., p. 56), and has found that rats inoculated with the poison, in spite of being fed with a mixture of meat and garlic every day to the extent of 4 grams of garlic per day, succumbed to the disease in ten or thirteen days, even when their systems had been saturated with garlic by feeding on it a month previous to inoculation. Garlic, therefore, is neither a prophylactic nor an antidote to the poison. The same results followed the trial of hydrochlorate of pilocarpine as a remedy. The cats and rats experimented on died of hydrophobia, and the inoculation of the nervous matter produced the same disease in other subjects of experiment.

Dr. W. C. Gregg directs attention (*Brit. Med. Journ.*, Jan. 12, p. 56) to the great value of vinegar in *post-partum* hæmorrhage, a fact which cannot be too widely known, as vinegar is almost sure to be at hand and in such cases immediate action is required. He discovered its value by accident. He had ordered a wineglassful of brandy, and vinegar was administered by mistake; it had, however, the desired effect, the hæmorrhage ceasing immediately. Subsequent trials proved it to be superior to ergot in rapidity and certainty of action; so much so that it is not advisable to give it until after removal of the placenta.

The value of oil of hypericum for bedsores, as recommended by Dr. H. S. Snow, receives further confirmation from Mr. F. Clark, honorary consulting surgeon to the Leamington Provident Dispensary, who says he has used it with manifest advantage in severe cases. He adds that the oil requires exposure to the sun for three months to acquire the reddish brown tint. The name of the species of *Hypericum* from which the oil is derived is given in the *British Medical Journal* (January 5, p. 9) as "*Hypericum medium perforatum* which flowers in July." The name, however, will not be found in any work on British botany. *Hypericum perforatum* is a well-known plant, but why the word "*medium*" is used it is difficult to understand, as there is no variety of that name mentioned either in English botany or in De Candolle's 'Prodromus.' The remarks in Sowerby's 'English Botany,' ii., p. 146, indicates that *H. perforatum* is probably the plant intended, since it is stated under that species, "In country districts it is sometimes still used as a medicine, and oil in which the shoots or flowering tops have been steeped is sold by herbalists as oleum hyperiæ." Gerarde says of it, "a balsam prepared from it is a most precious remedie for deep wounds and those that are thoro the body, for the sinues that are prickt or any wound made with a venomed weapon. Dioscorides says: The seed drunke for the space of forty daies together cureth the sciatica and all aches that happen in the hips." The writer has known an ulcerated leg to be healed simply by the application of the bruised leaves of a shrubby garden species of *Hypericum*. Doubtless the properties of the plants of the genus are worth investigating, and may possibly, like the now disused willow bark and meadowsweet, be found to contain a substance as useful in other ways as the salicin contained in those two plants.

In continuation of the subject of the administration of anæsthetics, M. Paul Bert has recently communicated to the Paris Biological Society some details concerning his method of administering chloroform mixed with air (*Brit. Med. Journ.* Jan. 19, p. 132). He states that with such a mixture anæsthesia is reduced more slowly, but also more peacefully, the period of agitation being generally absent. The patient continues to sleep after the cessation of the inhalation, allowing of the dressing being effected painlessly, and upon waking is always calm and cheerful. As a rule a mixture

in the proportion of eight grams of chloroform with one hundred litres of air is easily endured, and less chloroform is necessary than is generally required, from 15 to 20 grams sufficing for operations lasting as many minutes. It was also stated by M. Dubois, the principal of M. Bert's laboratory, that anæsthesia is more rapidly induced during alcoholic intoxication.

Dr. A. H. Hassall has continued his experiments on the best mode of administering inhalations, and in the *British Medical Journal* (January 12, p. 47) he shows that the atmosphere of a room can be impregnated with disinfecting agents to an extent and with a rapidity dependent on the surface exposed to diffusion and the vitality of the substance employed. Thus 616 grams of thymol melted in hot water in a dish having a superficies of 64 inches entirely disappeared in twelve hours, being exposed during that time to a temperature of 161·6°F. For the same reasons creasote sprinkled on a towel was found not to volatilize so quickly as when a towel was dipped in a solution of it; less surface being exposed to diffusion in the first case than in the latter.

A subject has been brought forward by Dr. Carter Moffat, which, interesting in itself, stands some risk of being brought into derision by absurd statements made in connection with it. The fact that the inhalation of some gases is followed by perceptible effects upon the *timbre* of the voice is well known, and the observation might be well worth following up from a musical point of view. But according to certain statements Dr. Moffat's alleged discovery was arrived at in a different way. Assuming that there was a connection between the fame of Italian vocalists and the atmospheric conditions of their native country, it is said that he made repeated analyses of the air and dew in different districts of Italy and found peroxide of hydrogen and free ammonia always present. He therefore attempted to imitate these conditions, and this it is claimed he is able to do by means of inhalations through an instrument which he calls an "ammoniaphone," described as containing an absorbent material saturated with peroxide of hydrogen combined with ammonia and other ingredients. This "portable artificial Italianized air" is credited with remarkable physiological properties, since, as the result of fourteen days' experiments, it is said to have caused an expansion of Dr. Moffat's chest half an inch, and to have converted his voice, which was previously weak, harsh and destitute of intonation, into a pure tenor of extraordinary range. Demonstrations of the effect of inhalations through the ammoniaphone have been given in connection with lectures delivered at Glasgow, and according to the *Evening News* "the results were highly satisfactory."

A patent has been taken out in Germany by Messrs. Vorster and Grüneberg, for a process for preparing what they term "dry sulphuric acid," which resembles one already followed in the preparation of dynamite. It consists in saturating dry and finely powdered "kieselguhr" with three or four times its weight of 66° sulphuric acid. The product, which, therefore, represents at least 75 per cent. of its weight of absolute acid, is said to retain the pulverulent form, and the advantage claimed is that in this condition it can be transported by land or sea in lead-coated sheet iron vessels without danger of breakage. When required for such purposes as petroleum refining, the manufacture of dynamite, or the production of carbonic acid gas for aerated waters, it is stated that the "dry" acid can be used without previous treatment, the finely divided condition in which it is present in the powder being indeed advantageous in some instances; but where necessary, the strong acid may again be obtained in the liquid condition by a systematic washing of the powder, the "kieselguhr" remaining unacted upon and fit for use in a fresh operation. The process can also be applied to the other mineral acids.

Some interesting details of comparative experiments as to the value of calcium chloride and strong sulphuric acid as exsiccating agents have been published by Dr. E. Fleischer (*Zeits. anal. Chemie*, xxiii., 33). In order to avoid repeated weighings to ascertain the point at which the weight became constant, Dr. Fleischer introduced a delicate hygrometer by Lambrecht, by which he was enabled to observe the point at which no further change took place. The results obtained seem to show that both in respect to rapidity and completeness of the dehydration effected calcium chloride is far inferior to sulphuric acid. The apparatus used was a bell-glass of 2266 c.c. capacity, ground to fit air-tight upon a glass plate, within the bell-glass being placed the hygrometer and a glass vessel an inch in height and half the diameter of the bell, to contain the hygroscopic material. When the glass dish was covered with 60 grams of fused calcium chloride, in pieces about the size of a hazel nut, and covered over with the bell-glass, the hygrometer, which at first showed 62 of relative moisture, or equal to 10 grams of water vapour per cubic metre of air, fell in two hours to 31°, four hours to 25°, in six hours to 21°, and then remained stationary; only an imperfect dehydration had been effected, therefore, in that time. When, however, the calcium chloride was replaced by 20 grams of concentrated sulphuric acid, the hygrometer, which at first stood at 67° fell in thirty-five minutes to 30°, in fifty-five minutes to 18°, and in one hundred and five minutes to 0°.

In a communication to the Royal Society (*Proceedings*, xxxv., 345), Dr. Tilden and Mr. Shenstone have given an account of some experiments made with the view of determining the solubility of salts in water at temperatures above the boiling point of water. The main conclusion arrived at is that solubility is directly related to fusibility. When salts usually crystallizing in the anhydrous state are written down in the order of their melting points, it is observed that increase of solubility consequent upon a rise of temperature above 100° C. is greatest in the most fusible, the others following regularly in order of their fusibility, and that the higher the melting point of a compound the more nearly does a curve representing its solubility at temperatures above 100° C. approach a straight line.

In a communication to *Nature* (Dec. 20 and 27) Mr. Barlow puts forward an ingenious theory as to the probable nature of the internal symmetry of crystals. Mr. Barlow is of opinion that in the atom-groupings of a molecule the several atoms occupy distinct portions of space and do not lose their individuality. He therefore first proceeds to inquire what number of very symmetrical arrangements of points or particles in space are possible. Of these he describes five, and he argues that every one of the various symmetrical forms presented by crystals can be shown to be consistent with the subsistence of an

arrangement of the atoms of the crystallizing compound in one or other of these five kinds of symmetry at the time when crystallization begins. It is not meant by this that there are only five forms of crystallization; for although two of these kinds of symmetrical arrangement admit of no variation, in which compounds containing an equal number of atoms of two kinds have the atoms built up regularly, so that in one case each point is equidistant from the nearest eight points, and in the other equidistant from the nearest six points (cubic system), in the remaining three kinds, where the numbers of the dissimilar atoms in the molecule are unequal, a considerable amount of variation is possible in the arrangement of the third layer. Hence, whilst as a rule compounds consisting of an equal number of atoms of two kinds crystallize in cubes, in the case of water, where the dissimilar atoms are in the relation of 1 : 2, the arrangement of the atoms, according to the above theory, is capable of taking the form either of a six-sided prism or a rhombohedron.

Encouraged by his advance upon the results previously obtained by Messrs. Pictet and Cailletet, in the liquefaction of oxygen under the influence of the cold produced by the vaporization of liquid ethylene in a vacuum combined with pressure, M. Wroblewski has been pursuing his experiments upon the liquefaction and solidification of gases with some further success. He reports (*Comptes Rend.*, xcvii., 1553) that when a considerable quantity of liquid oxygen is caused to "boil" by the sudden removal of the pressure it does not solidify like carbonic acid, but leaves a crystalline residue at the bottom of the vessel, which disappears as the temperature commences to rise. The temperature at the moment of the formation of these crystals is estimated to be as low as – 186° C., and when liquefied nitrogen was submitted to this cold, by enclosing it in the vessel in which the oxygen was liquefied, and the pressure upon the nitrogen then slightly removed, it fell like snow, in crystals of a considerable size. In a subsequent communication (*Comptes Rendus*, xcviii., 149) M. Wroblewski states that hydrogen refrigerated by "boiling" oxygen is liquefied upon being released from pressure.

Last week, Professor Hughes read before the Institute of Mechanical Engineers an account of his further researches on the physical condition of iron and steel. In a previous paper (*Pharm. Journ.*, [3], xiii., 685), Professor Hughes stated his reasons, based upon the results of experiments with his induction balance, for believing that the molecules of soft iron, and even of hard drawn iron, are much less rigid as regards motion among themselves than the molecules of tempered steel. Since then he has continued his experiments and arrived at conclusions that he formulates as follows: (1) the magnetic capacity is directly proportional to the softness or molecular freedom; and (2) the resistance to a feeble external magnetizing force is directly as the hardness or molecular rigidity. Up to the present time mechanical tests as well as chemical analyses have failed to find any distinct line of demarcation between the numerous varieties of steel and iron, and this physical method appears to show that there is no such dividing line. But Professor Hughes is of opinion that by determining the magnetic capacity of a bar or wire of iron or steel a considerable amount of light may be thrown upon its homogeneity and other characteristics.

A "RENNET" FERMENT CONTAINED IN THE SEEDS OF WITHANIA COAGULANS.*

BY SHERIDAN LEA, M.A., TRINITY COLLEGE, CAMBRIDGE.

The Report of the Royal Gardens at Kew for 1881 contains abstracts of correspondence, in which it was pointed out that, in order to introduce a cheese-making industry in India, some vegetable substitute must be found for the ordinary animal rennet, since cheese made with the latter is unsaleable among the natives. In response to the above "Surgeon-Major Aitchison brought to the notice of the authorities at Kew that the fruit of *Puneeria*† *coagulans*, a shrub common in Afghanistan and Northern India, possesses the properties of coagulating milk;" and experiments showed that an aqueous extract of the seed-capsules of the above plant does somewhat rapidly coagulate milk.

I was recently requested to make some experiments on the seeds of *Withania* to determine whether they contain a definite ferment with the properties of ordinary rennet, and the applicability of such a ferment to cheese-making purposes.

The material supplied to me consisted of an agglomerated dry mass of seed-capsules and fragments of the stalks of the plant. When crushed in a mortar the whole crumbled down into a coarse powder, in which the seeds were for the most part liberated from the capsules. I picked out the larger pieces of stalk, sifted out the finer particles, chiefly earth and fragments of the capsules, and then by a further sifting I separated the seeds from the other larger particles. The seeds appeared to be each enveloped in a coating of resinous material, presumably the dried juice of the capsules in which they had ripened.

Taking equal weights of the seeds, I extracted them for twenty-four hours with equal volumes of (i) water, (ii) 5 per cent. sodic chloride, (iii) 2 per cent. hydrochloric acid, (iv) 3 per cent. sodic carbonate. Equal volumes of each of the above were added in an acid, alkaline, and neutral condition to equal volumes of milk, and heated in a water-bath at 38° C. The milk was rapidly coagulated by the salt and sodic carbonate extracts, much less rapidly by the other two; of the four, the salt extract was far the most rapid in its action. All subsequent experiments have shown that a 5 per cent. solution of sodic chloride is the most efficient in the extraction of the active principle from the seeds.

There is no doubt that the substance which possesses the coagulating power is a ferment closely resembling animal rennet.

I. A portion of the 5 per cent. sodic chloride extract loses its activity if boiled for a minute or two.

II. The active principle is soluble in glycerine, and can be extracted from the seeds by this means; the extract possesses strong coagulating powers even in small amounts.

III. Alcohol precipitates the ferment body from its solutions; and the precipitate, after washing with alcohol, may be dissolved up again without having lost its coagulating powers.

IV. The active principle of the seeds will cause the coagulation of milk when present in very small quantities, the addition of more of the ferment simply increasing the rapidity of the change.

V. The coagulation is not due to the formation of acid by the ferment. If some of the active extract be made neutral or alkaline and added to neutral milk, a normal clot is formed, and the reaction of the clot remains neutral or faintly alkaline.

VI. The clot formed by the action of the ferment is a true clot, resembling in appearance and properties that formed by animal rennet, and is not a mere precipitate.

Having thus determined the presence of a rennet

* Communicated by Professor M. Foster, Sec. R.S.—From the 'Proceedings of the Royal Society.'

† The genus *Puneeria* is now reduced by botanists to *Withania*.

ferment in the seeds, I endeavoured to prepare an active extract, which should be applicable for cheese-making purposes. All the extracts of the seeds are of a deep brown colour, and it appeared, therefore, in the first place, desirable to obtain less highly coloured, if not colourless, solutions, which should still be active. In this I have so far failed. The precipitate caused by alcohol carries down the chief part of the colouring-matter also, so that on being subsequently redissolved the solution is nearly as highly coloured as before the precipitation. The colour can be removed by using animal charcoal, but the ferment is at the same time destroyed. If all excess of charcoal is avoided and the solution is filtered at once, the filtrate is largely decolorized, but contains only traces of the ferment. Animal rennet is similarly removed by filtration through charcoal. The colour can be removed by the addition of very finely-powdered kaolin in a dry state, but, as before, the ferment activity is thereby destroyed. The same holds good of animal rennet. The colouring-matter is scarcely soluble in either ether or alcohol, so that no advantage is gained by a preliminary treatment with these before extraction with the salt solution. I have also endeavoured to get rid of the colour by treating the seeds as rapidly as possible with successive quantities of water before making the final extract. By using a centrifugal machine I was able to wash the seeds six or seven times with large volumes of water without their being exposed for any considerable time to the action of the water. Each portion of water was highly coloured and the seeds were thus freed from adherent colouring-matter. But, apart from the fact that some, though not much, ferment is thus lost, no special advantage is obtained, since the seeds are themselves coloured, and even after prolonged treatment with water the final extract is always of a dark brown colour.

In order to obviate the disadvantages of this colouring-matter, if disadvantage it is, I have found it best to prepare very concentrated active extracts of the purified seeds, so that it should only be necessary to add a very small quantity of the extract in order to coagulate the milk and obtain a colourless curd. This I have done by grinding the dry seeds very finely in a mill and extracting them for twenty-four hours with such a volume of 5 per cent. sodic chloride solution that the mass is still fluid after the absorption of water by the fragments of the seeds as they swell up. From this mass the fluid part may be readily separated by using a centrifugal machine (such as is used in sugar refining), and it can then be easily filtered through filter-paper; without the centrifugal machine the separation of the fluid from the residue of the seeds is tedious and imperfect, 40 grams of the seeds treated as above with 150 cubic centims. of 5 per cent. sodic chloride solution gave an extract of which 0·25 cubic centim. clotted 20 cubic centims. of milk in twenty-five minutes, and 0·1 cubic centim, clotted a similar portion of milk in one hour. When added in these proportions the curd formed is quite white. The presence of the colouring-matter is, however, perhaps on the whole unimportant, since even if a larger quantity of the ferment extract is added in order to obtain a very rapid coagulation the colouring matter is obtained chiefly in the whey, the curd being white.*

The question of preparing an extract which should be capable of being kept for a considerable time is perhaps of importance. Ordinary commercial rennet usually contains a large amount of sodic chloride and some alcohol. One specimen I analysed contained 19 per cent. of common salt, and 4 per cent. of alcohol. I have, therefore added to the 5 per cent. chloride extract mentioned above, enough salt to raise the percentage of this to 15 per cent., and also alcohol up to 4 per cent. The activity of the extract is not appreciably altered by this, and such a preparation corresponds very closely in activity with a commercial solution of animal rennet with which I compared it. The possibility of making extracts which may be expected to keep is thus indicated, but of course time alone will show whether the activity of the ferment is impaired to any important extent by such keeping.

I may add in conclusion that I have coagulated a considerable volume of milk with an extract such as I have described, and prepared a cheese from the curds. I have also given a portion of the extract to a professional cheese-maker who has used it as a substitute for animal rennet in the preparation of a cheese. The product thus obtained, and the statements of the person who has made the experiment for me, lead me to suppose that extracts of the seeds of *Withania* can be used as an adequate and successful substitute for animal rennet.

* It is extremely probable that some stage in the growth or ripening of the seeds of *Withania* might be found at which the development of colouring-matter is slight, while at the same time the ferment is present in considerable quantity.

THE HYPOPHOSPHITES WITHOUT SYRUP.*

Dr. G. S. Gerhard recommends the following formula:—℞ Calcii hypophosph., Potassii hypophosph., Sodii hypophosph., āā gr. j; Quiniæ hypophosph., Mangan. hypophosph., āā gr. ¼; Ferri hypophosph., gr. ½; Strychniæ hypophosph., gr. $_1\frac{1}{20}$; Glycerini, ♏iij; Liq. acid. hyposulph., ♏ij; Aq., ad fl. ℥j. The addition of a definite amount of hyposulphurous acid prevents the precipitation of at least two of the salts (those of iron and manganese). The solution is clear, slightly fluorescent and pleasantly acid. This formula is certainly an improvement on the ordinary syrups, the excess of sugar in which often decreases the appetite and deranges digestion. Two minims of acid. phosphoric. dilut., B.P., if substituted for the hyposulphurous acid in the above formula, appear to be equally efficacious in preventing precipitation. If the iron and manganese be omitted, a few drops of dilute hydrobromic acid serve to maintain the other ingredients in clear and permanent solution.

THE PRESS ON THE SALE OF POISONS.

From the Saturday Review, *January* 26.

It is high time that some steps should be taken to amend the present state of the law on poisons. Many of us have been long under the happy delusion that the Act of 1868 was quite sufficient for the purpose of protecting the public. But, owing to defects in its wording, it is easily and systematically evaded, and a recent decision of the House of Lords has practically abrogated one of its principal provisions. Not only are poisons openly sold by unqualified people, but so are drugs of other kinds so inferior in quality as either to be useless or else actually deleterious. Nearly all drugs are more or less poisonous at best, but bad drugs are doubly so; and it is difficult even by legislation to protect people who are not learned in their properties. They are absolutely at the mercy of the vendors, who may call any substance by the name of a medicine, and the buyer has no means of ascertaining the truth or falsehood of the description. This view is borne out by many recent examples, and is put forward prominently by some of the most eminent members of the Pharmaceutical Society. In a recent address Dr. Attfield, the President [of the British Pharmaceutical Conference], called public attention to it, and asserted that the present condition of things is worse than before the Act of 1868. The Act prohibited any one from taking the title of "chemist and druggist," and practising under it, without having qualified at an examination, and being placed on the State Register. But by some oversight no provision was made for the case of drug-sellers who did not take the title of "chemist," and the result is that a grocer may keep medicines, and sell them as if they were food or chandlery. Nay more; though the adulteration of food is forbidden, and the buyer is able to judge for himself, with drugs he cannot judge, and the State does practically

* From the *Phil. Med. Times*, November 3, 1883. Reprinted from the *Medical Times*, January 26, 1884.

nothing for his protection. True, the State forbids the sale of ostensible poisons, or rather draws a line between some poisons and others; but even this provision is easily evaded. Under cover of a patent-medicine stamp such poisons as opium, laudanum, and morphia are constantly sold by grocers or general dealers. Soothing syrups alone, which may be bought everywhere, are accountable for a vast number of deaths, and bring up infant mortality, especially in London, to its present appalling figure. It is asserted that in some districts in which opium is largely sold it is put up in regular packets, labelled "Sedative Powder," or some such name, sealed with a 1½*d.* stamp, and sold by any one who holds a patent medicine licence. The respectable chemists refuse, as they are bound to do, to sell deadly poisons in dangerous quantities to any stray customer; but it is notorious that in other places—wherever, in short, an unauthorized chemist carries on his trade—the merest formality, such as signing a name, suffices, and the poison is sold, no questions being asked. This is, of course, the strong point in the complaints recently made by the pharmaceutists. It remains to be seen how far they are justified in their protests; but, admitting that the will of the nation was revealed in the Act of 1868, it is difficult to avoid the conclusion that something more must now be done to give it effect.

Oddly enough, the whole question is complicated by another, with which at first sight no one would think it had any connection whatever. We hear enough about the enormities of co-operative stores from tradesmen whose former profits are now cut down; and for the most part we turn a deaf ear to their complaints. The stores are a convenience; and if the small tradesman is unsuited to the spirit of the times, he must go, as other people have had to go in the course of ages. But when the chemists complain of the stores, their case is wholly different. Their complaint may be in part selfish, like that of the grocers, but it is also in part, and that the larger part, for the public good. Co-operative stores have peculiar advantages in the sale of drugs. If they are managed by seven owners or more, they are absolutely in this particular beyond the reach of the Act. According to the recent decisions, a co-operative store may even sell poisons "if no registered assistant is employed," thus simply reversing the obvious meaning and intention, though not, of course, the letter, of the Act. But even as regards single shopkeepers it is inoperative. Professor Attfield gives particulars of many cases, described by his correspondents, in which most drugs are openly sold, and a few in which "not only ordinary poisons, but the scheduled poisons," are also to be had, but under certain bonds of secresy. The druggist who has studied and has passed his examinations has no chance with the unqualified grocer or the storekeepers. They can both undersell him and make capital by pointing out what an extortioner he is. We have knowledge of a certain virulent and deadly poison which can be bought wholesale at about 4*d.* the pound, but which a chemist retails at about 4*s.* the ounce, and rightly so. But the unqualified druggist sells it at a moderate price, if he sells it at all, and perhaps binds his customer to secresy as well, thus involving him in a conspiracy to break the law. A single grain of that particular poison has frequently produced death, yet in many different households enough may be met with to poison a regiment. There is a law regarding another poison which seems to be very seldom observed. Sulphuric acid is one of the most easily obtained, and one of the most destructive agencies known of its kind. Hardly a day passes but we read some case of "vitriol throwing." Vitriol being practically colourless may easily escape notice until too late. The public are partially protected against arsenic by its being, when sold in small quantities, coloured with indigo. The rule is frequently evaded, but it should be enforced and applied to sulphuric acid also. Dr. Attfield, in his speech at Southport, was necessarily more immediately concerned with the honour and the standing of his professional brethren than with the convenience or safety of the public; yet it is remarkable how completely the two were shown to be interdependent; and no one can doubt that a lowering in the standing and character of the dispensers of drugs must result, not only in loss to the qualified chemist, but in still more disastrous consequences to the consumer.

The quantity of medicine now prescribed and used is very much less than formerly. In 1830, for example, at St. George's Hospital the cost for every in-patient's medicine was 16*s.* 5*d.* In 1880 it was less than half. Partly this is owing, no doubt, to a cheapening in druggists' wares; but it is also due to the alteration in medical practice. Leeches, for instance, which used to be so frequent, are now seldom seen. Blisters are characterized by some eminent physicians as mere useless torture. Instead of a costly black draught, we have a few pence worth of some pleasant effervescing mixture. The whole aspect of medicine-taking has been altered. Ten years ago, even, a new-born baby received a dose calculated to injure it for life; and twenty years ago all children had medicine once a week, whether they wanted it or not. Mrs. Squeers with her brimstone-and-treacle was no exaggeration. Such scenes as Dickens describes in 'Nicholas Nickleby' were common not only in such places of Dotheboys Hall, but in every large boarding-school, when many of us were almost grown up. At the present day, therefore, the apothecary cannot expect the same sale for his simples as formerly; but the public is not on that account the less justified in demanding greater security and greater excellence. The patent medicine system is liable to all kinds of abuses, and should be abandoned. It brings in a trumpery sum, and is a legalization of quackery. The very name of "patent medicine" is a lie. We have by the abortive Act of 1868 acknowledged that something should be done. The principle is admitted. Of course before 1868 it was open to any one to object that it is "grandmotherly legislation" to interfere with the sale of drugs. But no such argument will hold now, except perhaps with such old ladies and their friends as supported Mr. Stansfeld on a recent occasion. The right of the free-born Briton to make a beast of himself with drink is seriously called in question; but before proceeding to limit the sale of such a comparatively innocuous compound as beer or gin we should endeavour to protect ourselves both from adulterated drugs and also from poisons. Every daily paper contains stories of poisoning. Three have appeared this very week, each of which could have been prevented by proper regulations. A prisoner is poisoned in the very hands of the police. A child is poisoned by a quack. A husband obliterates features he once professed to admire by the use of a little sulphuric acid. The list might be indefinitely prolonged. Where did all these people obtain their poisons? It would be well worth the while of the Pharmaceutical Society to make a list of such cases for say three months, and to ascertain in each case if possible where the poison was bought. If it should be found that all or a majority came from stores, grocers, and other unauthorized dealers in drugs, the case put by Dr. Attfield would be immensely strengthened. It is perfectly true that legislation can hardly be evoked at the present day—in the so-called "Nineteenth Century," as it has recently been described—for the prolongation or strengthening of a monopoly; but, if the chemists can show that it is owing to the unauthorized sales of drugs and poisons that these shocking tragedies, so far from being less common than before 1868, are actually more common and on the increase, they may come to Parliament with a very good case; and when some of the much less important measures to which the present Government has pledged itself to please its Radical supporters have been disposed of, a Bill in extension, explanation, or confirmation of that of 1868 may be passed, and English people may be protected like Frenchmen, Germans, Italians—indeed almost all nations—against the occurrence of such horrors as we have mentioned.

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THE SALE OF NARCOTICS.

THE report, on another page, of the proceedings in connection with an inquest held at Moss Bank, near St. Helens, supplies a vivid illustration of the evil results attending a custom widely prevalent in the manufacturing districts, and also shows how ready local authorities are to imitate the waggoner of the classics and invoke extraneous help instead of using the power they already possess to do the work that lies before them. The death, which was the occasion of the inquiry, was, probably, typical of many that take place continually, the principal difference being that now and then one—like that at Moss Bank—attracts passing attention through becoming the subject of an investigation before a coroner; but even then, after a certain amount of more or less wise official and volunteered commentary, it passes into oblivion. In the case under notice, a child, nine years old, being sick and purged, was dosed by his mother with an ounce of a compound called "Indian tincture," which she had purchased from a grocer. As to the nature of the compound, or the quantity that could be safely administered to a child, both buyer and seller appear to have been profoundly ignorant; the latter ingenuously saying that he had sold the compound for five or six years in the state in which he had received it, and that when asked by the buyer whether half an ounce would be too much for a child, he had replied that he did not know. The posological demonstration followed, however, in due course; but as it was made upon a poor creature not protected by an analogue of the Vivisection Act, it has involved no punishment upon the originators, beyond the very problematic quantity resulting from twinges of conscience. The mother having administered the medicine went out, hoping, no doubt, that before her return it would bring relief from the vomiting and purging. And so it did, though not in the way desired; for when she came home the child was comatose, and a quarter of an hour afterwards it lay dead in her lap, the victim, in the opinion of the medical practitioner who was called in, of narcotic poisoning.

In consequence of the nature of the evidence given at the inquest, the Coroner ordered an analysis to be made of the contents of the stomach as well as of a sample of the "Indian tincture," and the report of Dr. CAMPBELL BROWN is instructive. He found the tincture to contain about 30 per cent. of its volume of methylated spirit, a small quantity of ether, sugar, extractive and two kinds of resin. One of these resins had been derived from capsicum, the other is conjectured to have been the resin of *Cannabis Indica*, apparently upon the grounds that this resin is capable of producing symptoms similar to those observed in the child. But we think that the influence of the doubtful resin may be safely ignored, for although Messrs. SMITH found that the two-thirds of a grain of Indian hemp resin acted as a powerful narcotic,* yet since the total quantity found of the two resins together only amounted to 0·012 per cent. of the tincture, and of this the greater part was capsicum resin, the amount of the other resin contained in the ounce of tincture would only have been a small fraction of half a grain. The symptoms would seem to find a sufficient explanation in the fact that the child, exhausted by vomiting and purging, had swallowed a third of an ounce of methylated spirit, besides a quantity of ether. Upon inquiry it was found that the mixture had been supplied wholesale to the grocer by a "licensed patent medicine dealer," and that the stock bottle bore a label in which the preparation was vaunted as "the only original highly medicated tincture for coughs, colds, bowel complaints, etc."

We are thus brought face to face with a traffic that has, according to the evidence, been carried on during five or six years at least under conditions that involved continuous breaches of two highly penal laws, though neither of these happened to be the Pharmacy Act, as the Coroner appeared to suppose. In the first place the use of methylated spirit in the preparation of any article capable of being used internally as a medicine is an offence under the Spirits Act, punishable with a fine of one hundred pounds; in the second place the sale of a preparation recommended on a label or in any way by public advertisement as a remedy for the cure or relief of any disorder, unless the seller shall hold a licence and the thing sold shall bear a stamp of value in proportion to the price for which it is sold, is an offence rendering the seller liable to a penalty of ten pounds for each sale. It must not be understood, however, that we in any way intend to convey approval of the sale of compounds containing poisonous substances under the cover of the Medicine Stamp and Licence Acts, or that conformity with these Acts is any sufficient guarantee for the public safety in such cases. But, however this may be, if the proper authorities under existing circumstances did their duty the penalties recoverable under these Acts would be equal to any profit that could be derived from this trade, and the sale of probably more than one deleterious preparation would be thus stopped. The statistics quoted by the Coroner as to

* *Pharmaceutical Journal*, [1], vi., 172.

the extent to which the trade in this class of preparations is carried on in the St. Helens district are hardly surprising to those who have any knowledge of the subject, and we notice with satisfaction the moderation of his statement, as compared with what is occasionally asserted, that he only believes that some of them contain opium. There is no doubt many of these preparations put forward more or less ostensibly as narcotics are carefully kept outside the application of the Pharmacy Act, notwithstanding the fact that the names they bear and the statements put forward in respect to them may suggest, to those competent to judge, that they may contain a scheduled poison. Probably with respect to a large number of them the provisions of the Sale of Food and Drugs Act or of the Excise Acts would be more applicable for their control as those of the Pharmacy Act. When, however, the police authorities are in possession, as they are frequently said to be, of certain information that preparations of opium or any other scheduled poison are being sold indiscriminately by shopkeepers, it undoubtedly becomes their duty to put in force the provision of the seventeenth section of the Pharmacy Act, which relates to labelling, which would also facilitate proceedings under the section that restricts the right of selling such poisons to qualified persons.

On the occasion of an inquest held recently at Eastbourne, as has already been mentioned, the Coroner refused to admit that a pharmaceutical chemist actually engaged in business was exempt from serving as a juror on an inquest, and intimated that he intended in future to enforce his opinion, if necessary, by means of a fine. We understand however, that, acting under the instructions of the President of the Pharmaceutical Society, the Solicitor has brought under the notice of the Coroner the specially inclusive words of the Act in relation to the exemption of pharmaceutical chemists, and that there is reason to hope the threatened contingency will not arise. Meanwhile, should any pharmaceutical chemist be summoned to serve on a coroner's jury it is desirable that he should at once put himself in communication with the Secretary. Whilst referring to this subject we may remark that it is important to remember that the exemption is not a personal privilege and should not be claimed as such, but is a condition imposed by the Legislature for the protection and safety of the public at large.

* * *

An Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, the 6th inst., at 8.30 p.m. On that occasion Messrs. Dunstan and Short will continue their Report on the Pharmaceutical Preparations of Nux-Vomica, dealing with the Preparation of a Standard Extract and of a Standard Tincture of Nux-Vomica. There will also be a paper on "The Estimation of the Alkaloids in the Root of *Atropa Belladonna*," by Messrs. Dunstan and F. Ransom, and one on "A Sample of Sophisticated Oil of Turpentine," by Mr. Boverton Redwood.

The *British Medical Journal* says it is understood that it is the intention of the Government to re-introduce the Medical Bill of last session with certain modifications, and that it is not probable that it will be again allowed to drop.

* * *

The past week has seen the issue of the first part of the new English Dictionary that was projected in 1857, by the Philological Society. Since that time hundreds of volunteers in Great Britain and the United States, as well as in other countries, have been working assiduously in the compilation and arrangement of materials, and the work is now being printed under the editorship of Dr. J. A. H. Murray, the President of the Philological Society, at the Clarendon Press, Oxford. The size of the work, which it is estimated will extend to six volumes of fourteen hundred quarto pages, will put it beyond the reach of more than a comparatively few private individuals, but there can be no doubt that it should be included in every library of any pretension. It promises to be a most valuable work of reference, and some idea may be formed of the wide range of literature that has been ransacked for words and quotations illustrative of their history and meaning from the fact that the complete series of the *Philosophical Transactions* from the year 1665 has been laid under contribution.

* * *

The interesting memoir on Kolas, by Messrs. Heckel and Schlagdenhauffen, an abstract of which appeared in last week's Journal, furnishes a fresh illustration of the desirability that investigators should make themselves acquainted with the existing literature of any subject they are working upon. It has been brought under our notice that the plant yielding "bitter kola," which those authors supposed themselves to be the first to identify, was identified as a species of *Garcinia* by Dr. Maxwell T. Masters eight years ago, and was partly described and the fruit figured by him in the *Journal of Botany* for March, 1875.

* * *

A fortnight since the *Medical Press and Circular* quoted from a German source a "well-found story" about the etymology of the word "charlatan," according to which it originated in connection with a Paris doctor, named Latan, who took to driving through the streets—crying his wares and looking out for patients—on a one-horse waggon (*char*). This is said to have given rise to the phrase, "Voilà le char de Latan," afterwards abbreviated into "charlatan." A correspondent in the following number, however, upsets this ingenious rendering by pointing out that the word is related to the Italian *ciarlare*, to prate, and *ciarlatano*, a quack.

* * *

We learn from the Barcelona *Enciclopedia Médico-Farmacéutica* that a committee of delegates of the pharmacists in the Spanish capital has recently presented a memorandum to the Governor of Madrid, pointing out certain abuses that exist to the injury of the public health, such as the distribution of globules by homœopaths to their clients, the sale of dosimetric granules, medical consultations in pharmacies and drug stores, the existence of pharmacies owned by unqualified persons, and other objectionable practices not unknown to pharmacists in our own country.

The endorsement of nostrums by leaders in medical and other branches of science in this country has on different occasions found varying explanations; but we doubt whether any of them has been so suggestive of the impudent side of smart advertising as one that has been communicated to the New York *Medical Gazette* by Professor Hamilton. The Professor, having seen a circular issued by a wine dealer, in which his name appeared as recommending certain wines, writes to say that some time since the wine dealer brought to him an album and laying it open before him asked him to add his name to those of other members of the medical profession which it contained and that he complied. But he protests that if the album contained, as he is now informed it did, recommendations of any wines, he was not aware of the fact. The *Medical News* asks, what more urgent plea could be presented for the abolition of the unprofessional habit of lending names to promote the interests of dealers in wines and nostrums?

* * *

The energetic Director of Public Gardens and Plantations in Jamaica, Mr. D. Morris, appears to have taken advantage of a recent vacation trip to collect a number of seeds and plants of economic importance, with a view to attempting their cultivation in the island. Among those obtained from Kew were a fine well-grown set of *Cinchona Ledgeriana* plants, as well as specimens of *C. caloptera* and *C. Calisaya*, var. *Josephiana*; a good strong scammony plant (*Convolvulus Scammonia*), which it is intended to attempt to cultivate in the hills; a plant of *Aloe Socotrina* and one of *A. Perryi*; this last mentioned, however, has not survived the voyage. Other plants obtained were the *Garcinia Mangostana*, *Quillaia Saponaria*, *Piper methysticum* (kava-kava), *Olea Europæa*, *Quercus Suber* and *Dracæna Draco*. Since his return also, a pot has been received from Kew containing about fifty plants of *Dracæna Cinnabari*, the species which, acccording to Professor Bayley Balfour (see before, p. 372), yields the true dragon's blood, as collected in the island of Socotra, referred to by Pliny and other old authors.

* * *

According to a comparison contained in a German official report the extent of the utilization of the post office as a means of communication by people of different European nationalities is represented by the following figures, which show the number of letters, post cards, etc., sent anually per head of population according to the returns for the year 1882 or the latest previous year for which a return had been made:—Great Britain, 52·5; Switzerland, 49·8; Belgium, 42; France, 35·3; Netherlands, 32·6; Germany, 31·8; Denmark, 30·6; Luxemburg, 23·1; Austria, 17·4; Sweden, 14·8; Norway, 14; Italy, 11·1; Hungary, 9·4; Spain, 7·1; Portugal, 6·9; Greece, 3·6; Russia, including Poland, 2·9; Roumania, 2; Servia, 0·7; Bulgaria, 0·5. In respect to the gross amount of business transacted by the Post Office Department, the United Kingdom ranks first, Germany second and France third.

* * *

In the earlier business days of the late Professor Holloway he appears not to have been averse to advising individuals upon the treatment of their particular complaints, and for this purpose he kept a printed form with blanks that were filled in according to circumstances. A quotation from the first paragraph of one of these forms, as filled in for a consultant in 1846 (the written words being printed in italics), may interest some of our readers and illustrate one method of creating a demand for specialties. The sentence runs, "I would recommend *eight* of my pills to be taken night and morning for the first *fifteen* days, *ten* night and morning for the following *thirty* days, and *twelve* night and morning might be taken after that time for about *thirty* days longer, or until such time as a perfect cure might be effected." The prescriptiou, therefore, provided for the consumption of 1560, or 130 dozen pills. There was also a general direction to "rub plenty of my ointment into your chest night and morning, as effectually as forcing salt into meat."

* * *

The Paris correspondent of the *Lancet* states that after a service of more than a half a century as Director of the Gobelins manufactory, M. Chevreul has been placed on the retired list. In consideration of his great services the illustrious chemist has been allowed to retain the full salary; but such is the wonderful juvenility of which he appears conscious that although only wanting two years to become a centenarian he is said to resent his retirement as premature.

* * *

The proposal for the more frequent appearance of the *Archiv der Pharmacie*, the organ of the German Pharmaceutical Association, is being carried into effect, and the new volume commences with the issue of fortnightly parts, which are to consist of from thirty-two to forty-eight pages each.

* * *

In the case of Chave and Jackson *v.* Kitson heard last week in the Chancery Division of the High Court of Justice, before Mr. Justice Kay, a perpetual injunction was granted against the defendant in respect to the use of the registered trade mark "Celandine" claimed by the plaintiffs.

* *

The Third Junior Pharmacy Ball is to be held at Willis's Rooms on Wednesday next. The Honorary Secretary is the gentleman who has so ably managed affairs in the two previous years, Mr. W. H. Kerr, 30, Conduit Street, W.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, February 7, at 8 p.m., when a "Note on Crystallized Phosphoric Acid" will be read by Mr. P. L. Huskisson, and the Reporter upon Physics, Mr. H. Allen, B.Sc., will make a report upon "Holtz's Electrical Machine and its Modifications," which will be illustrated by experiments.

* * *

The papers to be read at the meeting of the Chemical Society on Thursday next will be, "On the Influence of the Temperature of Distillation on the Composition of Coal Gas," by Mr. L. T. Wright; and "Researches on Secondary and Tertiary Azo-Compounds: No. II.," by Mr. R. Meldola.

* * *

A meeting of the London Section of the Society of Chemical Industry will be held in the rooms of the Chemical Society, Burlington House, on Monday next, at 8 p.m., when papers will be read—(1) "On the Disposal of Sewage Sludge;" (2) "On the Porter-Clark Process for the Purification of Water;" (3) "On Some Technological Applications of Kieselguhr."

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

January 22, 23 *and* 24, 1884.

Present on each day—Messrs. Baildon, Clark, Gibson, Gilmour, Maben, Nesbit and Stephenson.

Professor Maclagan was present on the 22nd and 23rd on behalf of the Privy Council.

MINOR EXAMINATION.

22*nd.*—*Fourteen* candidates were examined. *Six* failed. The undermentioned *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Barratt, William .....King's Lynn.
Black, James Watson .....Aberdeen.
Borthwick, Robert Waddell ...Bathgate.
Cairns, John .....Kelso.
Campbell, Charles.....Manchester.
Coats, John Thomson .....Edinburgh.
Cumberbirch, William.....Wilmslow.
Drummond, Robert Gordon ...Broughty Ferry.

23*rd.*—*Fourteen* candidates were examined. *Four* failed. The undermentioned *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Blackburn, Albert Ed. Henry...Eccles.
Findlay, James..... .....Glasgow.
Flett, Arthur .....Edinburgh.
Graham, Robert .....Langholm.
Hays, Richd. Tanner Orchard...Cirencester.
Hood, Thomas .....Leith.
Jack, James .....Arbroath.
Macintosh, John .....Edinburgh.
Mackay, Alexander .....Inverness.
Rennie, William .....Dumbarton.

24*th.*—*Thirteen* candidates were examined. *Four* failed. The undermentioned *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Miller, Alexander Sutherland...Edinburgh.
Mitchell, William Kirkpatrick...Wigton.
Morris, John Hall .....Bolton.
Parry, Richard .....Liverpool.
Patterson, David .....Bolton.
Percival, Thomas .....Falkirk.
Scott, Samuel .....Glasgow.
Shairp, William .....Glasgow.
Steward, Josiah William.....Bridgnorth.

PRELIMINARY EXAMINATION.

A meeting of the Board of Examiners for England and Wales was held on Wednesday, January 30, 1884.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificate of the College of Preceptors.

Hughes, David Thomas .....Carnarvon.

Certificates of the University of Cambridge.

Cox, Charles Earnshaw .....Doncaster.
Ralling, Ernest Lewis.....Colchester.
Sangers, Edgar Arthur .....London.

Certificates of the University of Oxford.

Atherton Henry Charles.....Tunbridge Wells.
Jackson, Frederick .....Manchester.

The following report of the College of Preceptors on the examination held on January 8 was received:—

Two hundred and seventy-eight candidated had presented themselves for examination, of whom *one hundred and fifty-one* had failed. The following *one hundred and twenty-seven* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

(Arranged alphabetically.)

Acutt, Frank Edward .....Wincanton.
Adams, Anthony Allan .....Salcombe.
Agar, Robert Langbourne .....Bridport.
Alford, Herbert Joseph .....Low Moor.
Allan, David..... .....Gorebridge.
Andrew, John Herbert .....Oldham.
Aspden, Henry.....Over Darwen.
Baxter, Gilbert.....Blackburn.
Bell, John Renwick.....Newcastle-on-Tyne.
Bethune, Andrew Wright .....Lochgelly.
Boe, John Alexander .....Edinburgh.
Bowie, Alexander... .....Kincardine.
Brazil, James Joseph .....Monkwearmouth.
Brittain, Florence.....Birmingham.
Brown, Arthur Miller .....West Malvern.
Brown, George Hy. Allan .....Liverpool.
Brown, Thomas .....Hayes.
Burden, Chas. Henry Brown ...Bude.
Callam, William Eggleton .....Ilford.
Cameron, John .....Aberfeldy.
Capon, Henry Charles.....London.
Cartwright, Benjamin .....Glasgow.
Chappell, Charles Creswell .....Bromsgrove.
Chatterton, Joseph Owen .....Stockport.
Cherrett, Ernest Robert .....West Hartlepool.
Clarke, William Ernest .....Aberystwith.
Clayton, William Arthur.....Sheffield.
Cleghorn, James .....London.
Cockburn, Charles Taylor .....Glasgow.
Cole, John Frederick .....Worcester.
Copp, William Risdon.....Southampton.
Couzens, Albert E. .....Westbury, Wilts.
Cranstone, Ernest Haughton ...Hemel Hempstead.
Dewar, Daniel .....Stirling.
Dunlop, Thomas William .....Berwick-on-Tweed.
Durant, William James .....Crewe.
Eastwood, Frederick Allen.....Rochdale.
Eastwood, Horace .....Milnsbridge.
Eatough, Nicholas William.....Blackburn.
Edwards, Richard .....Shrewsbury.
Emerson, Richd. Wm. James ...Hull.
Evans, Joshua William .....Llandyssul.
Evans, Thomas Henry.....Llanelly.
Ferguson, Joseph Johnston.....Southampton.
Fish, Benjamin, jun. .....Barrow-in-Furness.
Floyd, Joseph Arthur.....Alcester.
Ford, Arthur Miller.....Glasgow.
Ford, James .....Montrose.
Foster, Edgar Denney.....Rugby.
Fraser, Archibald Morrison ...Glasgow.
Furness, Alexander Scott .....Edinburgh.
Gibson, George Wood .....Whitby.
Gibson, William Thomas.....Collingham.
Goddard, Saml. Hy. Carter ...Southport.
Grassick, Alexander .....Aberdeen.
Griffiths, William Robert .....Clynderwen.
Hall, Sidney Charles .....Newark.
Hardy. Robert..... .....Edinburgh.
Heap, Alfred..... Kendal.
Heaton, George Edward .....London.
Heaton, Thomas .....Batley.
Hender, Walter Coad ....Plymouth.
Hepton, John Cussons.....Prescot.
Higson, John Russel.....Ruthin.
Hoare, William Richard.....Cheltenham.
Hornby, Arthur Smith .....Easingwold.
Howell, Albert.....Warminster.
Jeeves, Henry .....Brighton.
Jones, William.....Holyhead.
Joyce, Leonard.....Boston.
Kelland, Richard .....Banwell.
Kendall, George William .....Rawdon.

Kennish, Joseph .....Whitehaven.
Kidd, George Thomas .....Stowmarket.
Kimber, Mary Jane.....London.
King, Arthur Hill .....Maldon.
Lacey, Thomas .....Ketton.
Laycock, William Frederick ...Lowton.
Leaper, John Shirley .....Spalding.
Le Gros, Alfred Joshua .....Jersey.
Lenton, Joseph.....Hastings.
Lloyd, James Herbert.....Leicester.
Lyne, Walter Henry .....Grantham.
McClement, Thomas .....Penmaenmawr.
McLeod, William G. .....Nairn.
Madge, Herbert Abraham .....Ottery St. Mary.
Martin, John.....St Stythians.
Merrick, Wm. Stephen Nickels.Exeter.
Mills, George ....Southsea.
Mills, Herbert Henry .....Peterborough.
Morgan, James Gilbert .....Leamington.
Muir, George McCartney .....Cumnock.
Newman, Richard Seymour ...Hanley.
Ogilwy, Thomas William.....Windsor.
Orme, William Charles .....Atherstone.
Palmer, David Henry .....Peterborough.
Park, Frederick .....Tynemouth.
Perry, William Arthur .....Hitchin.
Pollard, Walter Henry .....Reading.
Prentice, Bertram .....Edinburgh.
Robertson, George .....Bridge of Allan.
Robinson, Joseph..... Sunderland.
Senior, George .....Llanfairfechan.
Simpson, Frederick Charles ...Pershore.
Slinn, Harry Edwin .....Burton-on-Trent.
Smith, Edward Charles H.....Hull.
Smith, Kate Love ..... Glasgow.
Smith, Robert William .....Edinburgh.
Stead, John Christopher .....Weston-super-Mare.
Stent, Frederick Richard .....Bath.
Stockdale, Richard .....Skipton-in-Craven.
Sturton, Frederick .....Peterborough.
Thornhill, Ernest .....Brighton.
Timmins, Albert .....Kidderminster.
Weatherby, Samuel MawdesleyBurslem.
White, James Leslie .....Edinburgh.
White, William John .....Edinburgh.
Widdowson, George William ...Leicester.
Wilkinson, Jacob Hardy.....Wibsey.
Williams, Cuthbert .....Leicester.
Williams, William .....St. Clears.
Wilson, George Alexander .....Aberdeen.
Winfield, George Fredk. .....Birmingham.
Woodington, Herbert .....Bristol.
Woolley, Edward James.....Manchester.
Wyatt, Alvan Lovell .....Stourbridge.
Wyllie, Harry Boak.....Kinghorn.

"College of Preceptors,
"Incorporated by Royal Charter.
"42, Queen Square, London, W.C.
"28 *January*, 1884.

"Dear Sir,—I send you herewith the copy of a short report made by the examiner on the recent Preliminary examination, supplementing the statement of marks forwarded to you to-day. "I am, dear Sir,
"Yours faithfully,
"C. R. HODGSON,
"E. Bremridge, Esq. "*Secretary.*"

"At the examination held in January, 1884, 278 candidates presented themselves at 36 centres with the following result:—

Passed 127 or about $45\frac{2}{3}$ per cent.
Failed 151 or about $54\frac{1}{3}$ per cent.

"Of the 151 who failed 78 failed in one subject only; 55 in two subjects; and 16 in all three subjects. Two candidates passed in the three subjects, but failed to obtain the required total.

"LATIN.

"Only 8 candidates brought up the 'Virgil,' and of these 6 passed the examination; of the other two 1 failed in Latin. In this subject an improvement has been steadily going on for some time past, especially in the answers to grammatical questions. The translation from the Latin is given very accurately in the large majority of cases, but very few indeed translate correctly into Latin the simple English sentences given.

"ARITHMETIC.

"This is still the 'plucking' subject. Of the 78 who failed in one subject only no fewer than 65 failed in this. Notwithstanding the special instruction in the Regulations, some of the candidates show no acquaintance with the metric system, and ignore the questions requiring for their solution a knowledge of it. To emphasize the importance of this branch of the subject, it would be well for some time to come that at least one question of this description should be given in every paper.

"ENGLISH.

"This, on the whole, at this examination was the best subject, and very few failed to write the composition creditably. Five candidates failed in English on account of errors in spelling, but the majority had no error of this description. The weakest point was the punctuation, some of the candidates ignoring stops and some others inserting them without any method whatever. I am of opinion that to draw attention to this it would be well that in the next two or three examinations a special test question on punctuation should be introduced.

"In conclusion, I desire to state that the alteration made by the Council in extending the hours of the examination is very satisfactory to the examiner, and, no doubt, it is also to the candidates. Ample time was allowed for carefully answering all the questions, and in very few cases indeed was there any internal evidence of a candidate being hurried."

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

	Candidates.				Candidates		
	Examined.	Passed.	Failed.		Examined.	Passed.	Failed.
Aberdeen	7	2	5	Lancaster	5	2	3
Birmingham	18	9	9	Leeds	14	5	9
Brighton	4	3	1	Lincoln	4	4	0
Bristol	9	6	3	Liverpool	11	4	7
Cambridge	3	1	2	London	32	13	19
Cardiff	6	2	4	Manchester	26	12	14
Carlisle	5	1	4	Newcastle-on-T.	7	4	3
Carmarthen	9	3	6	Northampton	3	1	2
Carnarvon	9	3	6	Norwich	2	1	1
Cheltenham	3	2	1	Nottingham	6	2	4
Darlington	4	1	3	Oxford	2	1	1
Dundee	7	2	5	Peterborough	6	5	1
Edinburgh	19	11	8	Sheffield	5	1	4
Exeter	6	3	3	Shrewsbury	1	0	1
Glasgow	21	9	12	Southampton	5	3	2
Hull	4	2	2	Truro	4	3	1
Inverness	2	1	1	Worcester	4	2	2
Jersey	2	1	1	York	3	2	1

The questions set for examination were as follows:—

LATIN.

(*Time allowed—from* 11 *a.m. to* 12.30 *p.m.*).

I. Translate into English either A. (Cæsar) or B. (Virgil).

The Candidate must not attempt both.

A. CÆSAR.

(i.) Tamen, ut spatium *intercedere posset*, dum milites, quos imperaverat, *convenirent*, legatis *respondit*, diem se

ad deliberandum sumpturum. (ii.) Ita dies circiter quindecim iter fecerunt, uti inter novissimum hostium agmen et nostrum primum non amplius quinis aut senis milibus passuum interesset. (iii.) His rebus cognitis, Caesar Gallorum animos verbis confirmavit, pollicitusque est, sibi eam rem curae futuram: magnam se habere spem, et beneficio suo et auctoritate adductum Ariovistum finem injuriis facturum. (iv.) Hac oratione habita, mirum in modum conversae sunt omnium mentes, summaque alacritas et cupiditas belli gerendi innata est, princepsque decima legio, per tribunos militum, ei gratias *egit*, quod de se optimum judicium fecisset, seque esse ad bellum gerendum paratissimam confirmavit. Deinde reliquae legiones, per tribunos militum et primorum ordinum centuriones, egerunt, uti Caesari satisfacerent: se neque unquam *dubitâsse*, neque timuisse, neque de summa belli suum judicium, sed imperatoris, esse existimavisse.

B. VIRGIL.

(i) Haec ubi dicta, cavum conversa cuspide montem
Impulit in latus; ac venti, velut agmine facto,
Quà data porta, ruunt, et terras turbine perflant.
Incubuere mari, totumque a sedibus imis
Unà Eurusque Notusque ruunt, creberque procellis
Africus, et vastos volvunt ad litora fluctus.

(ii.) Adloquitur Venus, O qui res hominumque Deûmque
Aeternis regis imperiis et fulmine terres!
Quid meus Aeneas in te committere tantum,
Quid Troës potuere, quibus tot funera passis
Cunctus ob Italiam terrarum clauditur orbis?
Certe hinc Romanos olim volventibus annis,
Hinc fore ductores revocato a sanguine Teucri,
Qui mare, qui terras omni ditione tenerent,
Pollicitus: quae te, genitor, sententia vertit?

II. Translate into Latin:—

(i) It is a mark of a foolish boy to wish to learn nothing. (ii.) What part of our earth is not full of labour? (iii.) Take care that you always follow the path of virtue. (iv.) The signal for battle having been given, the general exhorts the soldiers. (v.) The inhabitants of the provinces have been spared by the merciful conqueror.

III. Answer *four only* of the following questions:—

1. Give the principal parts of the verbs in italics in paragraph A.
2. Give the positive and comparative degrees of all the adjectives in the superlative degree in paragraph A.
3. Decline in full (singular and plural) *his rebus, eam rem*, in paragraph A.
4. Explain fully the construction of—*legatis respondit, diem se ad deliberandum sumpturum* (paragraph A, sentence i.), and *magnam se habere spem* (paragraph A, sentence iii.).
5. Give the principal parts of all the verbs in part (i.) of paragraph B.
6. Decline *vires, Deûm, orbis, mare*, in paragraph B.
7. Parse *passis* and *potuere*, in part (ii.) of paragraph B.
8. Make a list of all the deponent verbs in part (ii.) of paragraph B, and give their principal parts.

ARITHMETIC.

(*Time allowed—from* 12.30 *p.m. to* 2 *p.m.*).

1. A barrel containing 40 litres of liquid weighs 40 kilog. 5 hectog.; empty, it weighs 3 kilog. 9 hectog. Give in grams the weight of a litre of the liquid.

2. Simplify $2\frac{1}{2}+\dfrac{1}{3\frac{1}{3}+\dfrac{1}{4\frac{1}{4}}}-1\frac{1}{61}$.

3. Add together $\frac{3}{8}$ of a guinea, $\frac{3}{13}$ of a crown and $\frac{3}{10}$ of 7*s.* 6*d.*; and reduce the result to the decimal of 16*s.*

4. Divide 76·57 by ·0019; and multiply 50400 by $\frac{3}{7}$ of ·0008568.

5. If a sack of corn containing 1 hectol. 20 lit. cost 18 francs, what ought to be paid (in francs) for a sack of corn containing 1 hectol. 60 lit.?

6. If the rent of 13 acres 1 rd. 14 pls. for 150 days be £125, what quantity of the same quality of land ought to be hired for 88 days for £110?

7. A. can do a piece of work in 3 days, B. can do thrice as much in 8 days, and C. five time times as much in 12 days: in what time would they do it together?

ENGLISH.

(*Time allowed—from* 3 *p.m. to* 4.30 *p.m.*).

1. Name the Parts of Speech, and give, where you can, the derivation of each.

2. Define an Adjective. How are comparatives and superlatives formed in English? When is it impossible for an adjective to have any comparative?

3. State some reasons for considering the English Alphabet to be defective.

4. Correct the following sentences, giving your reasons:—

(*a*) You are a greater loser than me.

(*b*) Who did he give it to?

(*c*) Too great a space separates the third and fourth man.

5. Analyse the following sentence:—

"Kind nature's sweet restorer, balmy sleep,
Swift on his downy pinions flies from woe."

6. Parse the following sentence:—"I can tell you strange news that you yet dreamed not of."

7. Write a short composition on any favourite place or favourite book.

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The thirteenth annual *soirée* in connection with the Midland Counties Chemists' Association was held on Friday evening, January 25, in the Birmingham Town Hall, and from every point of view was the most successful gathering which the Society has held. Early in the evening there was a promenade concert, during which Mr. Stimpson gave an organ recital, and Messrs. Synyer and Gilmer's band performed a selection of music. Later dancing was commenced, and was continued until an early hour on Saturday morning, Mr. E. J. Reynolds carrying out the duties of the M.C. to the satisfaction of the company present. The hall was tastefully decorated by Messrs. Manton and Sons; the plants, of which there was a profusion, coming from Mr. Vertegan's nursery. Everything passed off in a manner highly creditable to Mr. Charles Thompson, who, as Honorary Secretary, had the arrangements of the *soirée* entrusted to his supervision.

LIVERPOOL CHEMISTS' ASSOCIATION.

The seventh general meeting of the thirty-fifth session was held at the Royal Institution, on Thursday evening, January 17, 1884. Mr. Edward Davies, F.C.S., F.I.C., in the chair.

The minutes of the previous meeting were read and confirmed and the following donations to the Library and Museum were announced:—*The Canadian Pharmaceutical Journal*, from the Editor; *The Pharmaceutical Journal* (two numbers), from the Society; and a complete set of the products of the distillation of shale, including specimens of crude shale, from the Young's Oil Co., Addiewell, presented to the Museum by Mr. H. A. Tobias.

The President then called on Mr. Haddock to read the paper of the evening on "The Uses of Permanganate of Potassium in Analysis."

The paper will be printed in an early number of this Journal.

Dr. Symes, in moving a vote of thanks to Mr. Haddock, said he was agreeably surprised to learn that eleven such important substances as those mentioned in the table given could be so successfully estimated by potassium permanganate. He trusted the paper would be published, as he thought it would be a valuable one for reference.

Mr. T. Fell Abraham had pleasure in seconding the vote of thanks, which was supported by Messrs. Parkinson and Ward.

Mr. Davies, in putting the resolution, said that for the estimation of tannin and manganese salts the volumetric method by potassium permanganate was of the utmost value, as the old method was exceedingly doubtful and uncertain, and in the case of manganese, when the quantity of the latter was small, it utterly failed to determine the same.

The motion having been put, was carried by acclamation, and Mr. Haddock having briefly replied, the proceedings terminated.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

The Manufacture of Gas from Limed Coal.

On Thursday, January 24, a paper was read by Professor Wanklyn before the Applied Chemistry and Physics Section of the Society of Arts, upon "The Manufacture of Gas from Limed Coal," special reference being made to Cooper's method of mixing lime with coal before distillation. The lecturer commenced by remarking that although the distillation of coal in the process of gas-making forms the chief source of the ammonia of commerce, it is nevertheless a well ascertained fact that only a small fraction of the total nitrogen of coal is made to take the form of ammonia in the distillatory operation as at present carried out. He then proceeded to point out the material differences between the products of the distillation of limed and of unlimed coal, which he said consisted in the limed coal yielding more of its nitrogen in the form of ammonia and a larger fraction of its carbon and a smaller fraction of its sulphur in the form of volatile compounds, besides leaving the coke in a more advantageous state for general use. The quantity of lime allowed in the process referred to, he said, was about half a hundredweight of quicklime to every ton of coal, the lime being slaked with about its own weight of water before mixture. It had been expected that the limed coke would not burn so well as common coke, owing to the presence of a greater amount of fixed matter in the form of lime; but this proved to be an advantage, for the calcium compound, acting as an oxygen carrier, caused the coke to burn more brightly and readily. It was also claimed that whereas common coke, when burnt, gives off fumes of sulphurous acid abundantly, coke prepared from coal properly limed evolves absolutely none. Professor Wanklyn stated that from the 2,000,000 tons of coal carbonized annually by the London gas works ammonia is distilled at an average of from 5 to 6 lbs. of ammonia per ton of coal, but that if the coal were limed before distillation the average would be raised to 12 or 15 lbs. per ton. If all the nitrogen in coal were converted into ammonia the yield would be from 25 to 50 lbs. per ton, but this production would reduce that of coke, as the latter contains a solid carburet of nitrogen. Without laying emphasis on the slight increase in the amount of volatile carbon compounds, the lecturer drew attention to the advantage to be derived from the diminution of the fraction of volatile sulphur when the coal is distilled with lime. He argued that it is known that sulphur present in organic compounds will readily attach itself to calcium if the compound be heated with lime, and therefore, theoretically sulphur cannot be evolved from coal in the presence of an excess of lime. In coal-gas the main portion of the sulphur exists as sulphuretted hydrogen, from 0·8 to 1·5 per cent. by volume being found in crude gas distilled by the common method, and about 0·3 per cent. of "sulphur compounds other than sulphuretted hydrogen." From the results obtained in a series of experiments made with crude gas from limed coal, the lecturer said it had been shown that the volume of sulphuretted hydrogen is diminished by about one-third. Professor Wanklyn further stated that in consequence of the fixation of the sulphur by the lime mixed with the coal, the use of lime purifiers could be dispensed with, whilst those filled with oxide of iron lasted much longer; indeed, it has been practically shown that as low an average as 3 grains of sulphur per 100 cubic feet of gas could easily be maintained by the mixture of lime with coal before distillation, and the use of oxide of iron purifiers alone. As regarded cost, he calculated that from the gain in ammonia and tar and the saving in purifying material, the decrease in expenditure would at least amount to one shilling per ton of coal carbonized. The lecturer concluded his paper by remarking that looked at from the sanitary point of view the use of limed coal would decrease the pollution of the air with sulphurous acid, and render gas as harmless as the electric light.

In the discussion which followed this paper, most of the speakers agreed that there was a considerable increase in the amount of ammonia obtained, which was estimated by some as a gain of about 30 per cent. One speaker stated that he had not noticed any decrease in the amount of sulphur in the crude gas manufactured from limed coal, and that though he had been biassed in favour of the process, he could not call it a success. Another speaker remarked that the white appearance of the limed coke lowered its market value, and the majority condemned its use for the purpose of heating furnaces, because of the damage caused to the flues, which had compelled the process to be stopped. The Chairman, Mr. D. Howard, in closing the discussion, drew attention to the great value now attached to the bye-products of the distillation of coal, as compared with their value a few years ago.

Professor Wanklyn in answer to the statements of some of the speakers, remarked that he thought the failure of the process when tried by them had been owing to imperfect mixture of the lime and coal before distillation. In answer to some questions put forward during the discussion, he stated that the presence of free carbonic dioxide in the gas did not materially diminish its illuminating power, but it had been always removed previously as a preliminary step to the elimination of the sulphur compounds; the oxide of iron purifiers now rendered this step unnecessary. He also reiterated his opinion that no decomposition of the sulphide of calcium took place in the presence of an excess of lime.

Recent Improvements in Photo-Mechanical Printing Methods.

The first of a course of Cantor Lectures, by Thomas Bolas, upon "Recent Improvements in Photo-Mechanical Printing Methods," was delivered before the Society of Arts, on Monday last. The lecturer mentioned that this course would be a continuation of a series of lectures delivered before the Society upon the same subject about four or five years ago. The present lecture was confined to an explanation of the Woodburytype process, the new developments of this method being especially dwelt upon. The process is based upon the fact that gelatine, slightly pigmented with bichromate of potash, is rendered insoluble in warm water by the action of light. Mr.

Bolas, accompanying his remarks by experiments, stated that the old method of obtaining the printing mould was to expose the gelatine with a negative for a certain time to a strong light, and then to wash away the soluble parts from the back or unexposed side with hot water. The mould was then mounted on tin foil coated with copper, and a sheet of glass attached by a resinous composition so as to form a stiff plate which would be able to stand pressure without harm to the mould. A more recent method is to commence by treating the gelatine mould with a solution of indiarubber in benzol; a sheet of tin foil is then placed over it, and in order to insure the tin foil covering the mould closely, they are passed between indiarubber rollers, the pressure being gradually increased. It has been found advantageous to use steel-faced tin foil for this purpose, the facing of steel enabling the mould to keep its surface for a longer time. Among some curiosities that the lecturer showed was the first printing mould made by Mr. Woodbury, and also some of his earliest printings. During the lecture, Mr. Bolas mentioned that it is little known that when ordinary paper is submitted to a high pressure it becomes semi-transparent, like opal glass or ordinary porcelain. Advantage has been taken of this by French manufacturers to copy watermarks, and some ingenious imitations were passed round for inspection. In concluding, he remarked that so rapid had been the improvements in photo-mechanical printing, that he considered it reasonable to expect that in a few years' time we might see photographs printed in the newspapers.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, January 24, Mr. H. G. Greenish, Vice-President, in the chair.

The first paper read was the following—

Note on Iodide of Cadmium.

BY F. W. SHORT.

Of late years, a good deal of speculation has taken place with regard to the elements, as to whether the bodies now generally considered elementary, because we have not yet been able to further decompose them, are actually *bonâ fide* elements, or whether many of them are not in reality compound bodies, like ammonium, but of very great stability. The relation between the atomic weights of many elements which display great similarity in other respects, such as chlorine, bromine and iodine, for example, has been thought to point to the conclusion that these bodies may really be compounds of actual elements in different proportions, similar to the hydrocarbons and analogous groups in the organic kingdom. For just as in the hydrocarbons, etc., we get a constant increase in molecular weight and an increased melting or boiling point for every CH_2 group introduced into the molecule, so in this series of elements, for example, as we ascend from the lowest or gaseous chlorine, to the liquid bromine and solid iodine, we get an increase in atomic or molecular weight corresponding to the increased boiling point.

If this speculation were correct, we should expect to find among the elements of higher atomic weight more examples of isomeric compounds than among the lower, just as is the case with analogous groups of organic bodies; and this is certainly the case with iodine, the yellow and red iodides of mercury and the three iodides of antimony being examples.

In order to ascertain if any other iodides presented similar modifications, Messrs. F. W. Clarke and E. A. Kebler have lately made various experiments, chiefly with iodide of cadmium, and their results were published in the *Chemical News* for December 28, 1883. They state that they prepared iodide of cadmium in various ways and obtained it in two distinct forms, one having a specific gravity of about 4·6, and the other, which was the commoner and more stable modification, about 5·6. Specimens prepared by digesting cadmium and iodine in sealed tubes exhausted of air and crystallization from water, by digesting the elements in water, and by double decomposition with cadmium sulphate and potassium iodide, all gave a specific gravity between 5·5 and 5·7, while a specimen prepared by dissolving cadmium carbonate in hydriodic acid and taking up some free iodine which had been produced with a little metallic cadmium, showed a specific gravity of 4·6; this was proved by quantitative analysis to be practically pure CdI_2. Three more specimens obtained by dissolving the carbonate in hydriodic acid all had the higher specific gravity. Another specimen of low specific gravity, viz. 4·658, was obtained by dissolving metallic cadmium in hydriodic acid; this was found to lose weight considerably on heating, becoming partially insoluble; by merely heating to 50° C. its specific gravity was altered to 5·14, and on twice more heating to 50° C. it rose to 5·545, showing according to the authors that the salt of lower gravity was very unstable and converted by heat into the other variety. They cannot state the conditions under which this unstable modification is formed, but suggest that nascent hydrogen may have something to do with its production, as in each case where they obtained it the salt had been exposed to nascent hydrogen.

I have made a few experiments in order to try and obtain a specimen of each kind to place before you. In the first place I took the specific gravity of three commercial specimens, using benzene, the medium employed by Messrs. Clarke and Kebler, with the following results:—

A	specific gravity 5·455
B	specific gravity 5·485
C	specific gravity 5·584

These salts were all taken in small crystals, and, evidently, all consisted of the normal variety. A specimen of cadmium iodide was then prepared by digesting together cadmium and iodine in water at about 60° C. until colourless, evaporating over a water-bath and crystallizing. The crystals were dried over sulphuric acid without heat, and were quite pure; their specific gravity was 5·667.

A specimen prepared by dissolving cadmium carbonate in hydriodic acid, adding a little metallic cadmium to combine with free iodine (the method by which Messrs. Clarke and Kebler obtained one of their abnormal specimens), evaporating to crystallization over a water-bath and drying over sulphuric acid, had a gravity of 5·089.

Another specimen was prepared by mixing equivalent proportions of sulphate of cadmium and iodide of potassium, evaporating to dryness over a water-bath, extracting the cadmium iodide with alcohol and allowing it to crystallize. The specific gravity of this was taken in small crystals, as in the preceding cases, but in this case more difficulty was experienced in getting rid of all air-bubbles. After considerable agitation, when no more bubbles seemed to come off, the specific gravity was, apparently, 4·511; however, on standing twenty-four hours, more bubbles could be got off, raising the apparent specific gravity to 5·347.

One of the other specimens (sp. gr. 5·667) was dissolved in alcohol and subjected to the action of nascent hydrogen obtained from metallic sodium. The soda was neutralized by sulphuric acid, and the alcoholic solution of cadmium iodide filtered off and crystallized. The specific gravity was taken in crystals, and the same difficulty was experienced with regard to air-bubbles as in the preceding case, where the salt had also been crystallized from alcohol. A first determination gave only 4·152, but after standing five or six hours, more air could be got off, and it then seemed 4·287. It appeared more probable, therefore, that the apparent lowness of specific gravity was due rather to air being inclosed in the interstices of the crystals than to the salt being abnormal, so a portion was rubbed into a fine powder and its specific gravity determined in that condition, when it was found to be 5·778.

As the salt when crystallized from aqueous solutions did not present the same difference between the crystals and the powder, it was thought that this might be due merely to their crystallization from alcohol; one of the preceding specimens (specific gravity 5·485) was therefore dissolved in alcohol and crystallized out.

The crystals were placed with benzene in a specific gravity bottle and placed under the bell-glass of an air-pump until no more air-bubbles could be got off; the gravity was then taken and found to be 4·375. More of the crystals on being powdered gave a specific gravity corresponding nearly with that originally found.

These results show that iodide of cadmium obtained by crystallization from alcohol has generally a lower specific gravity than that crystallized from water, but that this is probably due to the presence of air in the crystals, and not to their being in the abnormal condition described by Messrs. Clarke and Kebler, who do not state whether they used crystals or powder for the determination of the specific gravity. I have been unable to obtain any specimen which when powdered had a gravity less than about 5·5.

A discussion followed in which the Chairman, Secretary, Messrs. Dymond, Elliott and Thompson took part.

A vote of thanks was passed to Mr. Short.

The Reporter on Analytical Chemistry, Mr. C. Thompson, then read a report on "The Qualitative and Quantitative Separation of Chlorides, Bromides and Iodides," in which he brought under notice a modification of Vortmann's method, proposed by F. Jones, for their qualitative separation, and also the method proposed by Julius for their quantitative determination, based on replacing the halogen elements in the silver salts by each other. Mr. Thompson said he was still experimenting with these processes and would bring forward his results at a future meeting.

A discussion followed the report in which the Chairman, Secretary, Messrs. Cullinan, Dymond, Elliott, Ranken and Short took part.

The meeting then adjourned.

Parliamentary and Law Proceedings.

Poisoning by Prussic Acid.

An inquest was held in Worcester by Mr. R. T. Rea, City Coroner, on Thursday, January 24, concerning the death of Eliza Ross, aged 40, and her child, aged 6. It appeared that the deceased had been living apart from her husband and had been much depressed in consequence of not being allowed to have access to her children. On the day of her death she appears to have fetched the deceased child from school and the two were afterwards found dead together.

William Morris, chemist, Lowesmoor, said: On Monday evening last about seven o'clock I sold six pennyworth of prussic acid to the deceased. I knew her. The quantity was 3 drachms, which would be about three teaspoonfuls. Fifteen drops is a fatal dose, and the quantity I sold to deceased would make ten such doses. I observed the usual requirements of the law in selling the poison, and received from deceased the name of "Mrs. Jones, Carden Street." She paid the sixpence for it, and took the bottle produced away with her.

The Coroner: You said you knew deceased. Did you know her as Mrs. Jones?

Witness: I did not know her by name. I knew her as a customer for twelve months past. I had had no occasion previously to ask her name.

The Coroner: Was there anything particular about the manner of deceased to excite suspicion?

Witness: Nothing at all.

The Coroner: Did she appear calm, collected, and reasonable?

Witness: Yes.

The Coroner: Was anything said when you sold her the poison?

Witness: I asked her if she knew prussic acid was a powerful poison. She said "No." I asked her what she wanted it for. She said a friend had told her it was an excellent thing to clean with. I suggested that she should use some salts of lemon instead. She said, "I have tried that, and it has not answered." I produced my book, and said she would have to sign her name and address. Deceased said, "I have no objection to sign; I have done the same in purchasing mice poison at other shops." Whilst she was signing the book, which she did very slowly, I ran over the probabilities of the case, and as deceased had before bought laudanum of me, and had made no improper use of it to my knowledge, I considered it a *bonâ fide* purchase, and I let her have the prussic acid. Deceased received it in the bottle in which she had previously purchased laudanum.

Witness produced his register of the sale of poisons, and showed that the sale in question was attested by the name and address of the purchaser, the quantity and nature of the poison sold, and the purpose for which it was bought. There was, however, no signature in the space provided for the person introducing the purchaser, and Mr. Power, who was present throughout the inquiry, pointed out that the sale was therefore not in accordance with the statute.

Mr. Morris said he did not consider any introduction necessary in this caee, as deceased was an old customer.

Dr. Crowe said on Tuesday evening he was fetched to Mrs. Deakin's, in Lowesmoor, and saw the body of the deceased there, in a water closet. He had since made a *post-mortem* examination of the body. He discovered the presence of prussic acid by a chemical test.

Mr. Power (to witness): Have you ever heard of prussic acid being used for cleaning dresses?

Witness: Never.

Mr. Power: Is it usual for chemists to sell prussic acid for that purpose?

Witness: I think not.

Mr. Power: Do you think if I were to go to Mr. Virgo's or Mr. Steward's they would sell me prussic acid?

Witness: I should think they would not give it you in a poisonous quantity unless prescribed by a medical man. A fatal dose of Scheele's acid is twenty drops; and that is two and a half times stronger than the prussic acid usually sold.

After hearing other evidence, the Jury found a verdict "That the deceased committed suicide whilst in a state of temporary insanity, and also that she destroyed her child in a fit of temporary insanity." They added a rider to the effect that greater restrictions should be placed upon the sale of poisons.—*Worcester Daily Times.*

The "Indian Tincture" Poisoning Case.

The adjourned inquest on the body of Samuel Yates, nine years of age, son of John Yates, collier, Moss Bank, near St. Helens, was held on Saturday last by Mr. Hardy, Deputy Coroner. Mr. Finney, solicitor, Bolton, appeared to represent the maker of the Indian tincture, Mr. William Riley, licensed patent medicine dealer, Daubhill, near Bolton; and Inspector Whitaker watched the proceedings for the chief constable of the county. The facts, as already published, are that on the morning of the 12th inst. deceased complained of being sick and purged, and about noon his mother went to the shop of William Ashall, grocer, Moss Bank, and purchased an ounce of "Indian tincture," for which she paid 3*d*. On her return home she put a teaspoonful of warm water to the tincture and gave it to the sick boy. She then put him to bed, and left his step-brother, a lad named Cartwright, in the house, while she went to St. Helens. When his mother came home he was in a comatose condition, and died a quarter of an hour afterwards.

At the inquiry on Saturday the mother of deceased repeated her evidence, and said she had never before given

Indian tincture to any of her family. Some fifteen months ago her step-daughter, a young woman of twenty-five years, while in her house had bowel complaint, and she took ninepennyworth (three onnces) in five days. In cross-examination by Mr. Finney witness said it did her daughter-in-law good. She drank threepennyworth at a time.

The Coroner: But you know, Mr. Finney, her daughter-in-law is twenty-five years of age.

Witness: Ah! that makes the difference.

William Ashall said he sold the tincture to Mrs. Yates. He purchased it about five months since from William Riley, Daubhill, near Bolton. He had sold the tincture for five or six years. Working people—generally women—purchased it. From the time he received the tincture to the time he sold some of it to Mrs. Yates he did not put anything in it—he sold it in exactly the same state as it was in when he received it. He could not say that he ever knew an adult take an ounce for a dose. He had taken it himself, and drunk it out of the bottle many a time, not thinking it was anything dangerous.

The Coroner: Now you won't drink any more?

Witness: No fear.

The Coroner: What was the sensation after you had taken it—soothing, lulling?

Witness: When I have felt cold I have tasted it, and felt no different.

The Coroner: What age are you?

Witness: Thirty-three.

The Coroner: There is a difference between eight and thirty-three.

In reply to Mr. Finney, witness said he had sold it for children out of the particular bottle. About four weeks since he had sold half an ounce to Mrs. Yates for a child who was a little younger than deceased. Mrs. Yates told him herself it was for her child. She asked him if half an ounce would be too much for a child, and he (witness) replied that he did not know, but thought not. He then read her the doses from the label. He could not just say whether he had sold it to other people for children. They did not always say who it was for. Witness did not give Mrs. Yates instructions on the last occasion.

By the Coroner.—He was quite certain that Mrs. Yates came and purchased half an ounce of tincture from him four or five weeks ago.

Mr. Finney remarked that Mrs. Yates stated in evidence she had not had any before.

This was the whole of the evidence.

The Coroner said he had received Dr. Campbell Brown's report of his analysis, which he read, as follows:—"Analysis of a bottle labelled 'Indian tincture,' received from Mr. Superintendent Johnston, proves it to contain about 30 per cent. of its volume of methylated spirit, a small quantity of ether, and a very large proportion of sugar, probably more than 30 per cent. of its weight. It also contains two resins, one derived apparently from capsicum or cayenne pepper, and the other present in only very small quantities, and accompanied by other vegetable extractive matter. The weight of the two resins taken together is only 0·012 per cent. The smaller quantity of resin is not capable of being identified by any chemical means, and I believe that the only way in which its properties might perhaps be determined would be by making experiments on living animals. This I am prohibited by law from doing, and I can only conjecture that the resin may possibly be derived from Cannabis Indica or Indian hemp, a substance which yields such a resin, and which produces symptoms similar to those which have been described to me as resulting from the use of this tincture. At the same time I should point out that the administration of methylated spirit and ether was a dangerous proceeding, and might have produced many of the symptoms observed in the present instance. The tincture contains no opium. I have analysed the stomach and contents, and further examined the bottle of intestines. I have extracted from the stomach a small quantity of alcohol, and a trace of some resinous substance which it is quite impossible to identify. No opium is present, and there is no trace of any ordinary poison."

The Coroner then proceeded to address the jury. Having carefully reviewed the evidence, Mr. Hardy said the jury would have no difficulty in coming to the conclusion that the boy's death resulted directly from his mother having administered this Indian tincture. Was anyone responsible to the law for his death? He thought there was not the slightest evidence upon which they could answer that Mrs. Yates's object was any other than to see him better—a desire to stop his vomiting and purging. There was no suspicion, and the police did not even suggest any idea of foul play. That being so, he must tell the jury, and they must take the law from him, that what the mother did was in ignorance. Ashall was the next man who had to do with the Indian tincture. He would not say this man was guilty of gross neglect, but he did not evince that care and caution which a man with his intelligence should have done. He (the Coroner) had seriously considered whether he should not direct the jury to place him upon his trial for a serious charge, but having found from the police that he had evinced a great desire to assist them in this inquiry, and having heard his straightforward evidence, he did not think he had been guilty of wilful neglect, gross carelessness and recklessness, which the law required them to find before they called upon him to answer a charge of manslaughter. Then they came to the third person, Mr. Riley, by whom this mixture was made and sold to small shopkeepers. This Indian tincture evidently included injurious and deleterious ingredients, and was sold for all complaints, its virtues and efficacy being set forth in highly flown language on the labels. Although he might tell them that Mr. Riley was not criminally liable, he might be responsible to the law in another way which did not concern the jury. Especially he would direct the attention of the Inland Revenue authorities to the report which he had read from Dr. Campbell Brown and to the law relating to pharmacy. It was a most unfortunate state of things that men like Mr. Riley, in Liverpool, Manchester, Preston, and elsewhere should be permitted for one moment to concoct these mixtures and go about to little shopkeepers, or that the little shopkeepers should be permitted to retail such deleterious and injurious medicines. He had been told since that inquiry commenced by several medical gentlemen who had seen him and written to him, that if the public only knew the number of infants' lives that were annually sacrificed through their mothers dosing them with syrups and other compounds, they would be positively astounded. He (Mr. Hardy) had frequently held inquests upon children, and he was beginning to think himself, that in many cases where verdicts were returned, "Found dead in bed," "Died from convulsions," and so on, if they could get at the truth, it would be found that death was really the result of dosing them with syrups and other like compounds. Medical gentlemen had told him that the system of preparing and retailing these tinctures and drugs was doing a great harm to the working classes, and that even women were going to shops and drinking it as they would other things. Superintendent Johnston, of St. Helens, had taken the trouble to ascertain how many shopkeepers in St. Helens alone sold these mixtures containing opium and methylated spirit.

Mr. Finney: You do not mean shopkeepers who sell Indian tincture?

The Coroner said he meant Indian tincture and kindred mixtures. There were ninety-three shopkeepers in St. Helens who sold these mixtures. He believed they were all of a like kind to Indian tincture. He did not know whether they all contained such ingredients as Indian hemp, which was a powerful sedative, but some of them he believed did contain opium. In the Rainford section, of which Police-sergeant Smith had charge, there were eleven shops; and Superintendent Weir, of Wigan, said that within a mile radius of the spot where

he was located there were some thirty or forty persons who were selling not only Indian tincture, but kindred mixtures. In his (the Coroner's) opinion shopkeepers ought to be prohibited from dealing in these compounds. In this case he could not acquit Ashall from all blame; as it was his duty to have read over the label. The jury might say, if they liked, that the law ought to absolutely prohibit shopkeepers from selling these injurious and deleterious compounds.

After an absence of twenty minutes, the Jury returned with the following verdict:—"That the boy Samuel Yates died from the effects of the overdose of a mixture called Indian tincture, which was administered to him as medicine by his mother by misadventure." They also desired to say that although William Ashall was not criminally responsible for the death of deceased, they thought he deserved some censure for not informing the mother of deceased when she bought the mixture that the dose was as it appeared upon the label of the bottle produced, which he kept in the shop, and that Mrs. Yates was also to blame for not inquiring what should be given to a child. They further desired to make a presentment that they thought all shopkeepers ought to be absolutely prohibited by law from selling Indian tincture and mixture of a similar kind; and if in this case the law relating to the Inland Revenue had been broken by the manufacturer of this Indian tincture they hoped steps would be at once taken by the proper authority to enforce the penalty fixed by law. Mrs. Yates and Mr. Ashall were then called into the room and censured by the Coroner.—*Liverpool Daily Post.*

Poisoning by Ammonia.—A Wrong Bottle.

On Friday, January 25, a man named George Wragg died at Sheffield from poison administered to him by his mother, under the belief that it was a dose of medicine. The deceased was in well-to-do circumstances. He was married, but he separated from his wife some time ago, and had since been living with his mother. He had been under medical treatment for indigestion, and had been taking medicine. After he retired to rest on Thursday night his mother, an old lady of eighty, gave him what she thought was a dose of the medicine. The bottle, however, contained strong ammonia, which Wragg purchased some time before to clean some clothes. He soon afterwards experienced all the symptoms of having taken an irritant poison, and, in spite of prompt medical attendance, died in three hours.—*Standard.*

Poisoning by Arsenic.

On Monday, Mr. Hull resumed an adjourned inquest at Wandsworth Prison, on the body of George Robinson, aged 51, lately dwelling in Walworth, who died as reported last week.

Barnett, coroner's officer, stated that he had searched Mr. Robinson's room. Witness found a number of bottles, one of which contained arsenic. The deceased was traveller to a chemist.

The widow of the deceased, after having been cautioned by the Coroner, said that for years past her husband had been given to drink. He had struck her with a sharp instrument. While he was waiting at the police court she gave him a meat sandwich and some ale. After he had been sentenced he said to witness, "I shall never go through this three months," and asked for some more refreshment. She procured him some coffee, which he partook of.

J. Clarke, a friend of the deceased, stated that he accompanied last witness to see her husband. He procured some coffee from a neighbouring coffee house, and handed it to the gaoler, who gave it to the deceased.

The Coroner remarked that he was not satisfied with the evidence. He should report the case to the Home Secretary, and ask him to take up the matter.

After hearing the evidence of the daughter of the deceased, the case was again adjourned.—*Standard.*

BOOKS RECEIVED.

The Veterinarian's Pocket Remembrancer; being Concise Directions for the Treatment of Urgent or Rare Cases. By George Armatage, M.R.C.V.S. Second Edition. London: J. and A. Churchill. 1884. From the Publishers.

A Short Manual for Monthly Nurses. By Charles J. Cullingworth, M.D. London: J. and A. Churchill. 1884. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Solubility of Calcic Hydrate.

Sir,—I am pleased that Mr. Abraham has called attention to my statement regarding the solubility of calcic hydrate in the presence of carbonate, as I am unwilling that an error on my part should go forth uncorrected.

In estimating the proportion of hydrate in solution when carbonate was present, I did not allow the mixture to stand longer than two hours, and to this cause my low results are no doubt due. Believing, however, that I had not been so very far from the mark as Mr. Abraham's communication would show, I repeated his experiments, taking the precaution to wash the mixtures of hydrate and carbonate previous to use. After twenty-four hours the solutions were filtered, and titrated with seminormal oxalic acid, the following results being obtained:—

Percentage of $CaCO_3$ present.	Grain measures, seminormal oxalic acid required to neutralize 1000 grains.	Equal to grains CaO per fluid ounce.
15	90	·55
50	89	·54
75	87	·53
90	60	·36

From this it is evident that the admixture of carbonate with hydrate does make a difference in the strength of the solution, though the variation is not so great as my former statement indicated. The titrations were repeated in presence of my analytical assistant, Mr. Dechan, with the normal oxalic acid in use in the laboratory, the results obtained being practically identical with the above.

Without going into all the points raised in Mr. Abraham's letter, I may direct attention to his table, which bears internal evidence of untrustworthiness. I refer to the facts that all the four solutions contained lime in suspension; that No. 2 held more in suspension than No. 1 (and we might quite reasonably infer that Nos. 3 and 4 held more than No. 2), and that Nos. 3 and 4 are relied upon to prove Mr. Abraham's position, though it is evident that, the solutions not having been filtered, the results cannot be accepted as correct.

With reference to the solubility of the pure hydrate, it is apparently almost hopeless to expect any two observers to agree. It was not till after I had quite finished all my observations and was looking up the results obtained by others, that I began to realize how difficult it would be to arrive at figures that would be accepted as correct. There are contingencies connected with the test solutions in which the slightest variation of strength would show a considerable difference in the results, and sources of variation even in connection with the indicators employed, as shown by Mr. Thomson, in a recent number of the *Chemical News*, which render it highly probable that different results would be obtained by different observers. Any value that my paper may possess lies not so much in the fact that lime is stated to have a given solubility—the correctness of which might readily be disputed—but in the influence shown to be exerted by different temperatures, an influence which is well enough known, but which had not hitherto, so far as I am aware, been systematically investigated.

Hawick. Thos. Maben.

The Examination of Chemicals.

Sir,—Will you allow me to remark upon a few points in Mr. Symons's contribution to your issue of the 19th instant?

The value of such examinations is beyond question, but I fear that it is only too often left undone.

Liquor Potassæ.—Twenty ounces of pot. bicarb. would require 14·8 ozs. of slaked lime to combine with the whole of the carbonic acid thus—

$$KHCO_3 + CaHO_2 = KHO + H_2O + CaCO_3$$
$$100 \quad + \quad 74$$

It would appear as if Mr. Symons calculated pot. bicarb. as containing two molecules of water, but the test of purity given in Squire's 'Companion,' namely, 50 grains heated to redness leaves 34½ grains, *i.e.*—

$$2\,KHCO_3 = K_2CO_3 + H_2O + CO_2$$
$$\frac{200}{4} = 50 \qquad \frac{138}{4} = 34{\cdot}4$$

negatives this idea.

Peroxide of Hydrogen.—This unstable compound deteriorates rapidly, and therefore approximation to the stated strength is the best that we can expect to get. Mr. Symons's samples would seem to be rather bad, the volume strengths being properly only half of what he states, for half of the oxygen liberated is due to the bichromate. (See a paper in the *Analyst* for this month.)

Citrate of Magnesia.—It would be interesting to know what the public expect to receive when they ask for this; generally, I think, a powder which effervesces when dissolved in water, therefore the above is an obvious misnomer, for even a mixture of carbonate of magnesia and citric acid is not citrate of magnesia until chemical combination has actually taken place. I may presume (from experience) that the composition of the remainder of Mr. Symons's sample, which he omits to give, was sodæ bicarb. and ac. tart., or perhaps the latter partly replaced by ac. citric.

Liq. Sodæ Effervescens.—It is a well-known fact that only a few of the so-called soda waters contain any added soda at all, and it is well for the general consumer that they do not. I make this remark principally in order to advocate the alteration of the title of the beverage to aerated (or carbonated) water; also the manufacture of medicinal waters of various strengths, say 5 grains, 10 grains and 15 grains per bottle. The statement that ordinary town water contains chalk equal to 1·5 grain of sodic carbonate in each half pint is quoting from very widely differing quantities. I have before me the results of a great number of analyses of water supplies, and see that the temporary hardnes (due to $CaCO_3 + MgCO_3$) calculated as Na_2CO_3, varies from ·1 to 1·5 grain per half pint.

W. O. Nicholson.

The Supply of Prussic Acid.

Sir,—I should think most chemists who have read the Newton Abbot poisoning case, reported in the Journal of January 19, will be rather staggered to learn that anybody unconnected with the medical profession (either known or unknown to the seller) should have got possession of 6 drachms of prussic acid.

"Favourite dogs" on this side of the border are usually disposed of by the administration of prussic acid at the hands of the chemists' apprentices, who are careful enough with the dangerous drug. Signing the poisons sale book will not prevent suicide.

N. B.

In re Patent Medicines.

Sir,—In the Journal of January 12, Dr. Connell expresses his surprise that so many who are makers of patent medicines are unconnected either with pharmacy or medicine, and calls upon pharmacists to combine with medical men in order that the supply of medicines should be distributed through the proper channels; whilst, on the other hand, Mr. Allen says dispensing chemists would be only too willing to assist in the matter. Dr. Connell seems to be unaware of the fact that the chemist and druggist assists and greatly encourages the sale of patent medicines. Not only do the greater body of them conspicuously display the show cards, distribute the hand bills, and disseminate the other literature of the patent medicine vendors, but if we are to believe some of the advertisements, many of the trade, so anxious are they to oblige the maker and also benefit (?) the public that they write testimonials and otherwise manifest great anxiety to forward the sale, frequently also personally recommending the articles, to the amusement doubtless, and certainly to the profit, of their sometimes next-door neighbour, the oilman, etc., who, when a demand has been created by his shortsighted fellow-tradesman, lowers the price and sells the medicine. But Dr. Connell would be more astonished did he know that some of his medical brethren not only refrain from discountenancing the use of patent medicines put up by anybody, but also recommend and thus encourage the sale of them. Thus, it appears to me, those doctors and pharmacists both proclaim to their respective patients or customers, either that they are not capable of ministering to the needs of the public, or that they are indifferent alike to their own interests and also to those of other members of their own profession. The public must perceive this, and respect them accordingly.

Is Mr. Allen unconscious of these facts? We must have respect for ourselves before we ask others to respect us.

Pondo.

Sir,—With your kind permission I should like to say a few words on the important question of patent medicines. I am inclined to think it would be much better for the trade at large, it would improve our position in the estimation of an intelligent public and the medical profession, if chemists as a body, instead of puffing and supporting by every means in their power every nostrum that springs into publicity, would do all they possibly could to discourage the sale of them, and on the other hand, recommend to their customers, requiring medicine for slight indisposition, some preparation of their own with which they are thoroughly acquainted, and in which they have every confidence. I think it beneath the dignity of a chemist, with his knowledge of drugs and after the training he has had to go through, to recommend patents of which he, as a rule, knows absolutely nothing, and which generally are compounded of drugs and chemicals of a dangerous character.

Dispenser.

M. Conroy.—Thanks for your communication.

Alpha.—(1) The dispenser would not be justified in substituting one article for another, though he might on occasion withhold a dangerous dose; but 15 grams of potassium iodide is not a dangerous dose. (2) See a note on the change of colour this ointment is subject to in "Dispensing Mem.," No. 130, *Pharm. Journ.*, [3], ix., 65.

W. P.—Thanks for your note. You will see that the "Month" has not been omitted, but postponed, as is our practice occasionally when the last Saturday in the month falls early. We are glad to know that you so much appreciate this article.

Student.—A satisfactory mixture appears to be unobtainable. The prescriber should be referred to.

Inquirer.—Rub the quinine, finely powdered, with a little mucilage, and dissolve the salicin in a little of the aq. chloroformi with the aid of heat. A mixture containing tinct. sumbul and tinct. nucis vom. cannot be otherwise than opaque.

W. Barron.—The U.S.P. tinct. gelsemii is made by percolation with alcohol, specific gravity ·820, 15 parts of finely powdered rhizome being used for 100 parts of finished product.

H. Rainsford.—We are unacquainted with the book mentioned.

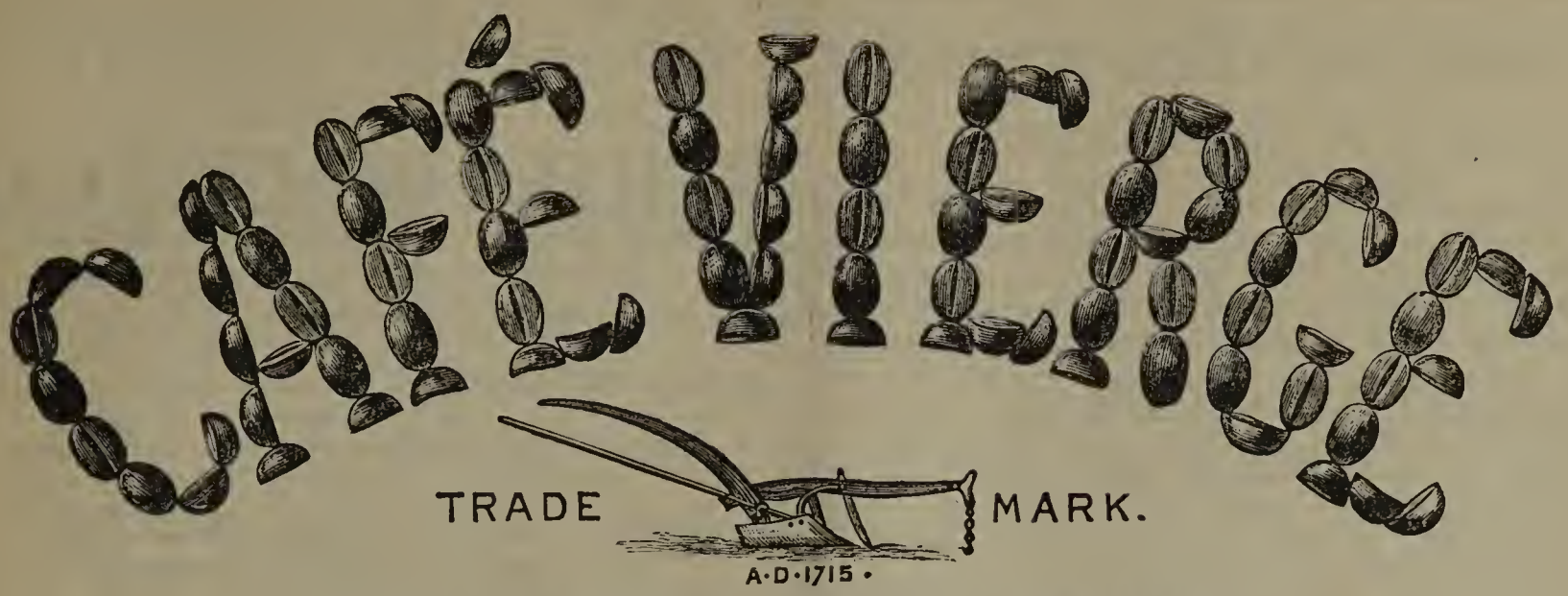
T. G. R.—The language of the 30th section of the Dentists Act is that "every person registered under this Act, shall be exempt, if he so desires, from serving on all juries and inquests whatsoever."

Annikcam.—The statement as to the solubility appears as quoted in the earlier editions of the work. We have forwarded your letter to the writer of the paper.

Hibernia.—The Pharmacy Act, 1868, does not extend to Ireland; but pharmacy in that country is regulated by an Act passed in 1875.

Novice.—We shall be happy to name the specimens if they are in good condition and do not exceed six in number.

Communications, Letters, etc., have been received from Messrs. Samuel, Ince, Gatehouse, Kerr, Masters, MacEwan.



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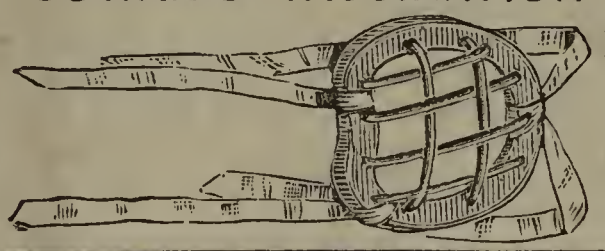

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Teacher: Mr. W. S. TURNER.

At this month's examination at Edinburgh, four Students from this School passed the Minor; and at London, in December, one passed, viz.—

Mr. R. M. B. TALLANTYRE.
" A. E. H. BLACKBURN.
" C. CAMPBELL.
" D. PATTERSON.
" MORRIS.

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The classes now being very well attended, they are all split, Mr. Turner taking some of the men, his assistant (a Minor man) the rest, thus carrying out the system of small classes, upon which the School has always been conducted.

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FOURTEENTH SESSION, 1883-4.

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For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

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TRINITY SQUARE, LONDON, S.E.

Director - G. S. V. WILLS, F.L.S., F.R.M.S

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AN active JUNIOR, for a brisk ready money trade. Must be able to Dispense. For Feb. 11. Personal application preferred. Also a vacancy for an APPRENTICE. Premium moderate. J. H. LEWIS, 22, Gt. Portland St., Oxford Circus, London, W.

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The
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AND
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Pharmaceutical Society of Great Britain.

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ELIAS BREMRIDGE, Secretary and Registrar.

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Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

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The next EVENING MEETING will be held on Wednesday, March 5th.

The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

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Papers intended to be read at the Meeting on March 5th should be forwarded to the Secretary not later than Wednesday, the 27th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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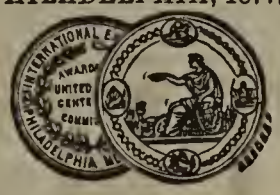

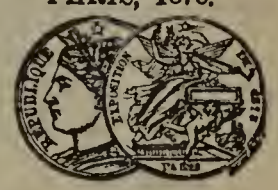

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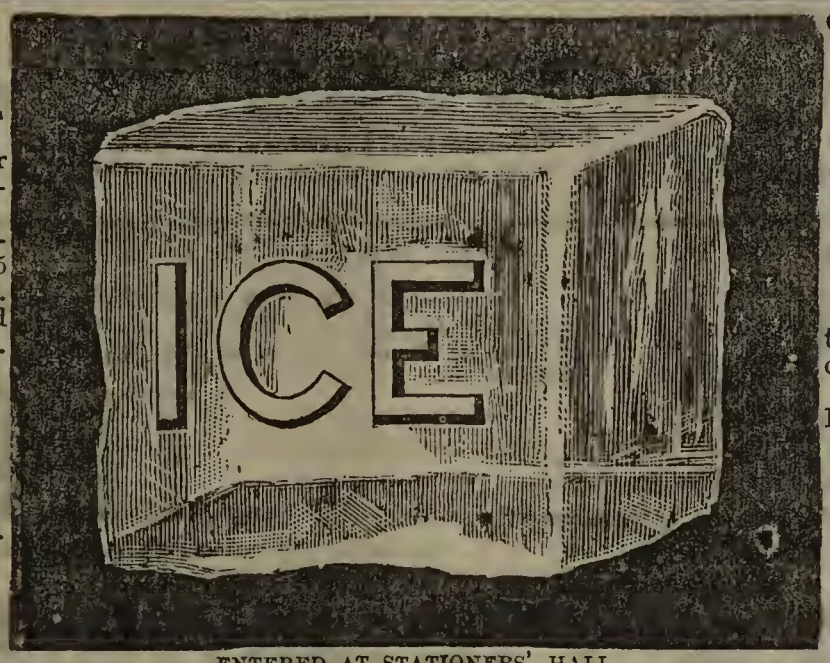

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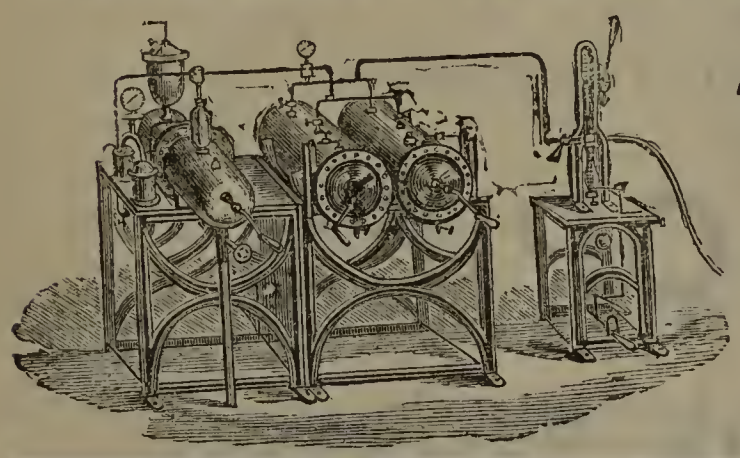

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ON FEBRUARY 23, 1884.

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REPORT UPON THE PHARMACEUTICAL PREPARATIONS OF NUX VOMICA.*

(*Continued.*)

IV. THE PREPARATION OF A STANDARD EXTRACT OF NUX VOMICA.

BY WYNDHAM R. DUNSTAN,

Assistant Lecturer in Chemistry and Physics to the Pharmaceutical Society and Demonstrator of Practical Chemistry in the School of Pharmacy;

AND F. W. SHORT,

Assistant Demonstrator of Practical Chemistry in the School of Pharmacy.

In previous communications to this Society and to the British Pharmaceutical Conference we have described the results of a chemical investigation of *Strychnos Nux-vomica* and its pharmaceutical preparations. Processes for the estimation of the total alkaloid in the nux vomica seeds, in the tincture and in the extract have been devised, and a method for the quantitative separation of strychnine and brucine has been proposed. At the last meeting of this Society the results of some experiments were communicated relative to the extractive power of alcohol of various degrees of dilution for the alkaloidal salts which are contained in nux vomica. Now our analyses of authentic and commercial specimens of nux vomica have shown that different specimens vary very considerably in alkaloidal content, and a very serious want of alkaloidal uniformity has been shown to obtain in the instance of commercial tinctures and extracts of nux vomica. In the present papers it is intended to apply the results of the above investigation in the preparation of a standard extract and tincture of nux vomica, that is, an extract and tincture of nux vomica which shall contain a definite and constant quantity of total alkaloid. Perhaps the most obvious method of attaining such a result would be in the first place to obtain a specimen of nux vomica which contained a known percentage of total alkaloid, and completely to exhaust a certain weight with a definite volume of alcohol. There are, however, certain practical difficulties connected with the complete exhaustion of nux vomica by a definite volume of spirit, and still greater difficulties in obtaining nux vomica constant in percentage of alkaloid, that led us to work upon somewhat different lines.

It is proposed at the outset to take a good commercial specimen of nux vomica in powder. We have previously shown that the powdered nux vomica at present in commerce is free from adulteration, and hence this substance can be used with advantage for the present purpose. In case of a necessity arising for obtaining nux vomica seeds in fine powder it should be noted that we have in a previous paper given a method for easily effecting this (*Pharm. Journ.*, [3], xiii., 1053). Commercial specimens of nux vomica contain, on an average, 3 per cent. of total alkaloid. The seeds having been obtained in a fine state of division they are extracted by percolation with a definite volume of alcohol of specified strength. The percolate is then measured and the quantity of total alkaloid is estimated in a given volume of it. The volume of this percolate which contains a quantity of alkaloid corresponding to the percentage of alkaloid which should be present in the extract is then taken and evaporated to a definite weight. We have fixed 15 per cent. as the quantity of total alkaloid which shall be contained in the standard extract of nux vomica; this decision is based upon a careful consideration of the results of our analyses of the extracts of nux vomica which are now used in medicine, which results were communicated at the last meeting of this Society.

It will be necessary now to consider some important practical questions connected with the actual preparation of the extract. It cannot, in the first instance, be too strongly insisted that the seeds should be in a very fine and uniform state of division, for unless this is the case, thorough and uniform extraction is impossible. In the extraction of the seeds we recommend the employment of a dilute alcohol, made by adding 25 volumes of water to 100 volumes of rectified spirit, for we have previously shown that alcohol of this strength has the highest solvent power for the alkaloidal salts which are contained in nux vomica. Extract of nux vomica is usually made by boiling the nux vomica with alcohol until exhausted; but it seemed to us that if the nux vomica could be exhausted with a comparatively small quantity of spirit without the aid of heat there would be a distinct advantage, especially in the manufacture upon the small scale. Experiments were therefore made in this direction. Thirty grams of nux vomica in impalpable powder were packed in a stoppered percolator, mixed with 60 cubic centimetres of alcohol (100 : 25) and allowed to macerate for twelve hours. Percolation was then commenced and when it had ceased an additional 60 cubic centimetres of the alcohol were poured upon the marc. When this had ceased to pass through the percolate measured 80 cubic centimetres. Sixteen cubic centimetres were analysed by the process which has been previously described (*Pharm. Journ.*, [3], xiv., 441), and it was found that the 80 cubic centimetres of alcohol had extracted 0·735 gram of alkaloid. A portion of the specimen of nux vomica employed had been previously assayed and found to contain 2·66 per cent. of total alkaloid; 30 grams consequently contained 0·8 gram of total alkaloid, so that 92 per cent. of the total alkaloid had been extracted by the 80 cubic centimetres of alcohol. To the marc were now added another 60 cubic centimetres of the alcohol; the percolate was analysed and found to contain 0·041 of alkaloid, making a total of 0·775 gram of total alkaloid extracted from 30 grams of nux vomica, which contained 0·8 gram of total alkaloid.

These experiments were now repeated upon a larger scale, and the quantity of extract as well as of total alkaloid was estimated in each successive fraction of the percolate. One pound of finely powdered nux vomica was intimately mixed with one pint of alcohol (100 : 25) and allowed to macerate for twelve hours. Percolation was then commenced and continued with more alcohol, portions of the successive fractions of the percolate being assayed for total alkaloid. A total quantity of four pints of alcohol was employed. The results were as follows:—

One pound of nux vomica, containing 189 grains of total alkaloid, was extracted with 4 pints of dilute alcohol (100 : 25).

* Read at an Evening Meeting of the Pharmaceutical Society, February 6, 1884.

Fractions of percolate.	Volume of fraction.	Amount of extract containing 22·67 per cent. of moisture.	Amount of total alkaloid (strychnine and brucine).
First fraction . .	26 ounces	856 grains	125 grains
Second fraction .	16 ounces	220 grains	32 grains
Third fraction .	10 ounces	74 grains	11 grains
Fourth fraction .	10 ounces	29 grains	3 grains
Total percolate .	62 ounces	1179 grains	171 grains

These results show that, proceeding in the above way, nux vomica is practically exhausted by four times its weight of alcohol of the specified strength. It will be noticed that maceration and percolation were adopted, principally because it was found that the first fraction of the tincture made by direct percolation deposited, after a short time, a flocculent precipitate that was not permanently redissolved by heat. No such result occurred when maceration was adopted, although the strong tincture if kept for some time, especially in cold weather, deposits a substance which is apparently a fatty acid and consequently contains no strychnine or brucine, and by gently heating is permanently redissolved. It now remained to prepare the extract from this strong tincture in which the amount of alkaloid was known. After a number of preliminary experiments it was found that 9 ounces (fluid) of this strong tincture, containing 10 grains of total alkaloid, were converted into an extract of suitable consistence by evaporating upon the water-bath until the product weighed 66·6 grains; that is, contained 15 per cent. of total alkaloid. In order to confirm the calculated alkaloidal content of this extract 1 gram was assayed and yielded 0·151 gram of total alkaloid, thus agreeing admirably with the calculated percentage (15 per cent.). We then prepared this standard extract from different specimens of nux vomica, representing high and low percentages of total alkaloid, and found that in all cases it was feasible to prepare a product having all the physical properties of a good extract and containing 15 per cent. of total alkaloid by the direct evaporation of the strong tincture.* The following is a description in official phraseology of the process which we propose for the preparation of a standard extract of nux vomica.

Take of—

Nux vomica in fine powder . .	1 pound.
Rectified spirit	64 fluid ounces.
Distilled water	16 fluid ounces.

Mix the spirit with the water and make the nux vomica into a paste with one pint of the mixture. Allow this to macerate for twelve hours, then transfer to a percolator and add another pint of the mixture. When this has percolated, pour on the remainder of the diluted spirit in successive portions; press the marc, filter the expressed liquid and add it to the percolate. Take of this liquid one fluid ounce and estimate the amount of total alkaloid in the following way:—Evaporate almost to dryness over a water-bath, dissolve the residue in two fluid drachms of chloroform and half a fluid ounce of dilute sulphuric acid with an equal bulk of water, agitate and warm gently. When the liquids have separated draw off the chloroform and add to the acid liquid excess of solution of ammonia and half a fluid ounce of chloroform, well agitate, gently warm, and after the liquids have completely separated transfer the chloroform to a weighed dish, evaporate over a water-bath and dry for one hour at 212° F. Allow the residue of total alkaloid to cool and then weigh. Take of the percolate as much as contains 131¼ grains of total alkaloid and evaporate over a water-bath until the extract weighs two ounces. This extract will contain 15 per cent. of total alkaloid.

Ten grains of this extract when treated in the following manner should yield one and a half grains of total alkaloid. Dissolve the extract in half a fluid ounce of water with the aid of a gentle heat and add a drachm of carbonate of sodium previously dissolved in half a fluid ounce of water; add half a fluid ounce of chloroform, agitate, warm gently and separate the chloroform. Add to this half a fluid ounce of dilute sulphuric acid with an equal bulk of water, again agitate, warm and separate the acid liquid from the chloroform. To this acid liquid add now an excess of ammonia and agitate with half a fluid ounce of chloroform; when the liquids have separated transfer the chloroform to a weighed dish and evaporate the chloroform over a water-bath. Dry the residue for one hour and weigh.

[*The discussion on this and the following paper is printed at p.* 634.]

* Of course such standard extracts prepared from seeds containing different percentages of alkaloid will not have the same consistence; but this variation in consistence is not sufficiently considerable to be of any practical moment.

REPORT UPON THE PHARMACEUTICAL PREPARATIONS OF NUX VOMICA.*

(*Concluded.*)

V. THE PREPARATION OF A STANDARD TINCTURE OF NUX VOMICA

BY WYNDHAM R. DUNSTAN,

Assistant Lecturer in Chemistry and Physics to the Pharmaceutical Society and Demonstrator of Practical Chemistry in the School of Pharmacy;

AND F. W. SHORT,

Assistant Demonstrator of Practical Chemistry in the School of Pharmacy.

In the previous paper we have proposed a process for the preparation of a standard extract of nux vomica, containing 15 per cent. of total alkaloid. In considering a feasible method for preparing a standard tincture of nux vomica, we were led by our former results to two suggestions. First, the dilution with alcohol of the assayed percolate (the method of producing which has been described in the former paper) to a definite degree, corresponding to a given percentage of total alkaloid, and second, the solution of a definite quantity of the standard extract in a given volume of alcohol. We propose that the standard tincture of nux vomica shall contain 0·24 per cent. of total alkaloid, that is 1 grain of total alkaloid in 1 fluid ounce of tincture. This proposal results from a comparison of the analyses which we have already published of the various tinctures of nux vomica now being used in medicine, and represents the alkaloidal content of a good commercial specimen. The mode of preparing the standard tincture by the first method is simple in procedure and eminently satisfactory in result. An experiment was made by taking that volume of the strong percolate, assayed as before described, which contained 20 grains of total alkaloid, this was diluted to one pint with alcohol (100 : 25). A pale yellow

* Read at an Evening Meeting of the Pharmaceutical Society, February 6, 1884.

perfectly clear tincture was obtained, every ounce of which contained 1 grain of total alkaloid. This tincture did not deposit or otherwise change after being kept for one month. A practical objection perhaps attaches to this method, as one for general use, which must be allowed to have some weight. It involves the preparation of two tinctures of nux vomica, the one strong, the other weak, and the substitution of the one for the other in dispensing would be attended with grave results; this perhaps is an objection to recommending the process for general use, although it is a point on which we speak with some reserve. A number of experiments were then made in connection with the second method. It has been already shown that with ordinary extract of nux vomica there is no very easy method of obtaining a solution in alcohol which is at once perfect and permanent (*Pharm. Journ.*, [3], xiv., 442). But it now seemed probable, having prepared an extract by exhausting the nux vomica with alcohol of definite strength and evaporating on a water-bath, that such an extract would redissolve in alcohol of the same strength that had been used in its production. One gram of the standard extract of nux vomica, containing 15 per cent. of total alkaloid, was mixed with 60 cubic centimetres of alcohol (100 : 25). By stirring the whole of the extract was dissolved and the perfectly clear tincture deposited a very small quantity of a white sediment after one month.* Some of the sediment was examined and contained no alkaloid. Thus a standard tincture of nux vomica could also be readily prepared by the solution of the standard extract in alcohol of certain strength. The tincture prepared as above detailed should contain 0·24 per cent. of total alkaloid and to confirm this the tincture was assayed and yielded 0·2402 per cent. of total alkaloid, thus coinciding with the calculated result. The standard tinctures prepared by the two processes which have been described contain, of course, the same percentage of total alkaloid. They differ in colour, that prepared by the first process being pale yellow, by the second, light brown; the latter also deposits very slightly, while the former is perfectly stable. For reasons already stated, we incline to recommending the latter process for general use; the former would probably be preferred by the manufacturer upon the large scale. The following is a description of both the processes which we have devised for the preparation of a standard tincture of nux vomica containing 0·24 per cent. of total alkaloid:—

I. Take of—

Nux vomica in fine powder . . .	1 pound.
Rectified spirit	64 fl. ozs.
Distilled water	16 „

Mix the spirit with the water and make the nux vomica into a paste with one pint of the mixture. Allow this to macerate for twelve hours, then transfer to a percolator and add another pint of the mixture. When this has percolated, pour on the remainder of the diluted spirit in successive portions; press the marc, filter the expressed liquid and add it to the percolate. Take of this liquid 1 fluid ounce and estimate the amount of total alkaloid in the following way:—Evaporate almost to dryness over a water-bath, dissolve the residue in 2 fluid drachms of chloroform and half a fluid ounce of dilute sulphuric acid with an equal bulk of water; agitate and warm gently. When the liquids have separated draw off the chloroform and add to the acid liquid excess of solution of ammonia and half a fluid ounce of chloroform; well agitate, gently warm and after the liquids have completely separated transfer the chloroform to a weighed dish. Evaporate over a water bath, and dry for one hour at 212° F. Allow the residue of total alkaloid to cool and then weigh.

Take that quantity of the percolate which contains 20 grains of alkaloid and dilute to one pint with a mixture of 4 parts by volume of rectified spirit with 1 part by volume of distilled water. This tincture will contain 0·24 per cent. by volume of total alkaloid and 2 fluid ounces of it when estimated, in the same manner as the percolate, should yield 2 grains of total alkaloid.

II. Take of—

Standard extract of nux vomica .	133 grains.
Rectified spirit	16 fl. ozs.
Distilled water	4 „

Mix the spirit with the water and dissolve the extract in the mixture. One fluid ounce of this tincture will contain one grain of total alkaloid.

In concluding this the last part of the Report we wish to gratefully acknowledge the valuable assistance which we have from time to time received from Professor Redwood, who has closely followed the progress of the investigation and made many fruitful suggestions which have contributed to its successful result. We also wish again to thank Professor Attfield for having allowed the work to be carried on in the Laboratories of the Pharmaceutical Society. The investigation has been largely aided by a grant from the Research Fund of the British Pharmaceutical Conference.

* The extract, it should be noted, will not wholly dissolve in rectified spirit.

THE ASSAY OF ATROPA BELLADONNA.*

I. THE ESTIMATION OF THE ALKALOIDS IN THE ROOT OF ATROPA BELLADONNA.

BY WYNDHAM R. DUNSTAN,

Assistant Lecturer in Chemistry and Physics to the Pharmaceutical Society and Demonstrator of Practical Chemistry in the School of Pharmacy;

AND F. RANSOM.

Many methods have been proposed for the estimation of the alkaloids which exists in *Atropa Belladonna*. The majority of these methods involve the use of solvents which extract large quantities of non-alkaloidal organic substances, and thus necessitate the subsequent use of other solvents and precipitants to purify and isolate the alkaloid. A great advance was made by Pesci (*Gazzetta di Chimica Italiana*, x., 425), when he showed that the alkaloid could be extracted in a comparatively pure state by benzene from an aqueous extract of belladonna after the addition of an alkali. The benzene was then agitated with dilute sulphuric acid, which was subsequently rendered alkaline with ammonia and the alkaloid removed by chloroform. Pesci's method of extraction, although a great improvement upon older methods, was still far from perfect and obviously could not be easily applied for the estimation of the alkaloid. In a previous paper† one of us has proposed a new method in plant analysis where a body soluble in chloroform has to be isolated. This

* Read at an Evening Meeting of the Pharmaceutical Society, February 6, 1884.

† Dunstan and Short, "The Assay of Nux Vomica" (*Pharm. Journ.*, [3], xiii., 665).

method was based upon the general principle that in plant analysis that solvent should be selected for the estimation of the active constituent which extracts this constituent with the smallest quantity of the other constituents, thus rendering unnecessary long processes of subsequent purification.

There are many solvents which can be used for this purpose, solvents which easily dissolve alkaloids, glucosides, etc., but less readily dissolve colouring matter, acids, sugars, etc. Chloroform is one which often admits of use, but it was pointed out in the paper referred to that chloroform alone was ill-suited for completely extracting the plant tissues, owing to its weak penetrating power. It was also proved in the special instance of nux vomica that this difficulty could be overcome by the admixture of alcohol with the chloroform; that is to say, while chloroform alone was incapable of extracting the whole of the alkaloid from nux vomica, when mixed with 25 per cent. of alcohol it was able to do so thoroughly and completely, leaving behind the whole of the mucilaginous constituents of the seeds and the other non-alkaloidal constituents, many of which would be extracted if alcohol alone were used. In the present paper we have extended this method of extraction with the chloroform-alcohol mixture to the isolation of the atropine and hyoscyamine existing in the root of *Atropa Belladonna*.

In preliminary experiments 10 grams of very finely powdered belladonna root were extracted with chloroform alone in a Dunstan and Short's extraction apparatus. The operation continued for three hours, during which time the root had been percolated twenty successive times with 50 cubic centimetres of boiling chloroform. The percolate, which had a light brown colour, contained much alkaloid when the residue was tested with phosphotungstic acid. The marc was mixed with lime and boiled with alcohol. The alcoholic residue also gave evidence of containing abundance of alkaloid when tested with phosphotungstic acid and also by its action upon the pupil of the eye. Thus the chloroform had not completely exhausted the root of alkaloid; the experiment was again repeated, the chloroform being allowed to act for a longer time, but yet the marc contained considerably more than traces of alkaloid. The same quantity of finely powdered belladonna root was now acted upon by a mixture of equal parts of chloroform and absolute alcohol under precisely the same conditions. The percolate contained much alkaloid, but no trace could be detected in the remaining marc. This experiment was likewise repeated several times with the same result. It was thus evident that just as chloroform alone had been shown to be an inefficient extractive agent for nux vomica it was now shown that the same obtains with belladonna, and similarly as a mixture of chloroform and alcohol was an excellent solvent for the nux vomica alkaloids, so the same mixture was an equally good solvent for the alkaloidal salts in belladonna. The next experiments were made with different proportions of chloroform and alcohol. A mixture of chloroform with 25 per cent. of alcohol occupied too long a time in accomplishing complete exhaustion to allow it to be made the basis of an easy process for general use. The best results were obtained with a mixture of equal parts of chloroform and absolute alcohol, which consequently was used in further experiments. It was found necessary to use absolute alcohol on account of the action of the water contained in rectified spirit upon the belladonna, which by causing swelling of the root and consequent clogging of the apparatus, seriously impeded the progress of percolation.

In these experiments the root was exhausted at the boiling point of the solvent (60°–70° C.). Experiments were now made to see whether belladonna could be efficiently exhausted by a mixture of equal parts of chloroform and alcohol without the aid of heat; but it was found that after percolating 10 grams of the finely powdered root with 150 cubic centimetres of the mixture the marc still contained a large amount of alkaloid, and it was evident that a great quantity of the solvent would be required for complete exhaustion. This although not an insuperable objection is a practical disadvantage, and having found that the belladonna root could be so well exhausted by the boiling solvent we at once proceeded to examine the effect of a boiling mixture of chloroform and alcohol upon atropine under the conditions of our experiments, and so to discover whether the alkaloid would be injuriously affected at the boiling point of the mixture. Pure atropine was boiled for six hours in an apparatus with an upright condenser with a mixture of alcohol and chloroform. The mixture was then agitated with dilute sulphuric acid and the alkaloid recovered from the acid liquid, after the addition of ammonia, by chloroform. The following results were obtained:—

	Atropine taken.	Atropine found.
α	0·085	0·084
β	0·221	0·217
γ	0·199	0·197
δ	0·213	0·208

The small differences in these figures are obviously accounted for by experimental errors, and the results, taken in conjunction with the fact that the residues were normally crystalline, prove that atropine is not decomposed or chemically altered even when exposed for six hours at the boiling point of the solvent which is proposed for use. We were now able to proceed further in developing the process. The belladonna root was now able to be exhausted with a boiling mixture of chloroform and alcohol, and it now remained to isolate the alkaloid in a pure state from the solvent. Dilute acids were at first used for this purpose, but it was afterwards discovered that the whole of the alkaloid could be withdrawn from the chloroform-alcohol mixture by merely agitating with water; two successive treatments with water in this way sufficed to remove every trace of the alkaloids from the chloroform-alcohol mixture. The separation of the water from the mixture is instantaneous and entire if the mixture is gently warmed; nearly the whole of the colouring matter remains dissolved in the chloroform, whilst the water retains the alcohol and the alkaloidal salts. By rendering the aqueous solution alkaline with ammonia and agitating with chloroform the atropine and hyoscyamine were obtained after evaporation in an apparently pure state; that is to say, the residue was entirely soluble in dilute acids, and when dissolved in chloroform and the solvent spontaneously evaporated the alkaloid remained as a mass of white silky crystals. However, one of the most important points to be demonstrated in such investigations as these is the perfect purity of the final alkaloidal residue, and yet this is a point which is generally assumed and not proved by workers in this field.

On a previous occasion* one of us has proposed a method for ascertaining the purity of residues of strychnine and brucine, which is founded upon the complete precipitation of these alkaloids (when nearly free from other organic substances) by a solution of tannin rendered faintly alkaline with ammonia. This process was tried with atropine and hyoscyamine, but with negative results, for the precipitate at first formed was soluble in excess of the reagent. Other reagents were now experimented with. Potassium mercuric iodide was found to be by no means a complete precipitant of atropine, and is useless for its detection when present in small quantity. Picric acid is also useless alike for the detection and estimation of atropine; even when considerable quantities of the alkaloid are present in solution this reagent fails to afford any indication. Phosphotungstic and phosphomolybdic acids are far more delicate than the former reagents, but even these are not sufficiently exact for quantitative use. As far as the detection of atropine and hyoscyamine is concerned a very delicate test is the dilating action upon the eye's pupil which is distinctly yielded by mere traces of the alkaloids. After attempting the quantitative application of many of the alkaloid precipitants with no success, we found one reagent which is admirably adapted for quantitative use. A solution of iodine in potassium iodide completely precipitates even traces of atropine and hyoscyamine, from a solution in dilute hydrochloric acid, as the dark green periodides. When other acids are present the precipitation is not quite so complete. After a great number of experiments had been made with this reagent, and also in reference to the decomposition of the periodides, we devised the following method for estimating the purity of residues of atropine and hyoscyamine. The alkaloidal residue is dissolved in dilute hydrochloric acid and to this liquid is added excess of a strong solution of iodine in potassium iodide. The precipitate which at once agglomerates is filtered off, slightly washed with the solution of iodine and decomposed upon the filter with a solution of sodium thiosulphate, when it entirely dissolves, forming a colourless liquid from which the alkaloid is removed by agitation with chloroform. This process gave very satisfactory results with pure atropine and the following results were obtained with the alkaloidal residues obtained in our experiments:—

	Residue taken.	Pure alkaloid found.
1	0·020	0·0185
2	0·019	0·0175
3	0·078	0·079
4	0·078	0·076

These figures indicate that the final residue of alkaloid obtained from belladonna root by the process which we have described consists of pure alkaloid. It should be noted that both atropine and hyoscyamine are much affected by prolonged exposure at 100° C., becoming sensibly darker in colour. The residues of alkaloid obtained in the process, and which usually weigh rather less than 0·1 gram, are light yellow in colour and have a fused appearance; crystals of the alkaloids may be obtained by redissolving in chloroform and spontaneously evaporating, when silky needles will remain if the chloroform was free from water. The following is a detailed description of the process which we propose for the estimation of the atropine and hyoscyamine in belladonna root. Twenty grams of the dry and finely powdered root are exhausted by hot percolation with a mixture of equal parts by volume of chloroform and absolute alcohol; if an extraction apparatus is used about 60 c.c. of the mixture is required. The percolate is agitated with two sucessive 25 c.c. of distilled water, which are separated in the usual way. These are mixed and well agitated with chloroform to remove the last traces of mechanically adherent colouring matter. The chloroform is separated, the aqueous liquid rendered alkaline with ammonia and agitated with two successive 25 c.c. of chloroform, which are separated, mixed and agitated with a small quantity of water (rendered faintly alkaline with ammonia) to remove adherent aqueous liquid. The chloroform is then evaporated over a water-bath until the weight of the atropine and hyoscyamine is constant, which usually occupies a little less than one hour.

The special features which distinguish this process are, (1) it is simple and accurate; (2) a high temperature is avoided; (3) the solvent employed extracts a minimum of non-alkaloidal constituents; (4) no precipitants are used; (5) the use of acids is avoided; (6) the alkaloids are not heated with alkalies.

The root of *Atropa Belladonna* grown at Hitchin and carefully dried at 100° F. yielded 0·38 per cent. of total alkaloid (atropine and hyoscyamine) when estimated by this process. Other specimens estimated in the same way yielded 0·39 per cent. and 0·35 per cent. of total alkaloid.

The work connected with this investigation has been aided by a grant from the Research Fund of the British Pharmaceutical Conference. In a future communication we propose to show how this process can be applied to the estimation of the atropine and hyoscyamine in other parts of the plant.

* Dunstan and Short, "The Analysis of some Authentic Specimens of Nux Vomica" (*Pharm Journ.*, [3], xiii., 1053).

NOTE ON A CASE OF SOPHISTICATION OF AMERICAN OIL OF TURPENTINE.*

BY BOVERTON REDWOOD, F.I.C., F.C.S.

A short time ago a sample, representing a shipment of several hundred barrels of oil of turpentine from Wilmington, was handed to me for examination by Messrs. Ingall, Phillips and Co., the wharfingers.

The odour of the sample was peculiar, and the specific gravity very high (·887). The flashing point (Abel petroleum test) was also somewhat high (96° F.). The flashing point of eleven other samples of oil of turpentine, presumably pure, imported about the same time from the United States, was 92° F., and the highest specific gravity 0·8676. Upon distillation in a current of steam the sample yielded 4 per cent. of a viscid residue, slightly heavier than water. The specific gravity of the distillate was 0·873. The residue, besides being some sixteen times greater in quantity, differed in physical characters from the residues similarly yielded by the eleven other samples just referred to. These residues ranged from 0·12 per cent. to 0·35 per cent.

I made a brief report upon the sample but was prevented, by pressure of work, from following up the matter, and I am now unable to procure a further quantity of the oil. My father has, how-

* Read at an Evening Meeting of the Pharmaceutical Society, February 6, 1884.

ever, been good enough to examine the resinous matter left upon evaporation, and with the kind assistance of Mr. Holmes to compare it with specimens in the Pharmaceutical Society's Museum, but has, I understand, not succeeded in identifying it. A distinctive feature is its persistently bitter taste.

It is worthy of remark that the sample was drawn during the landing of the cargo, and the sophistication must therefore have taken place prior to shipment. Oil of turpentine is occasionally adulterated with the crude turpentine, but the character of the residue yielded by this sample would appear to indicate that the resinous exudation from some tree other than those which furnish the American turpentine of commerce had been added. A friend engaged in the turpentine trade, who is returning to Charleston, South Carolina, this month, has promised to ascertain, if possible, what is likely to have been so employed.

THE PRESS ON THE SALE OF POISONS.

From the MEDICAL TIMES, *February* 2.

Several unfortunate cases have recently drawn attention to the facility with which poisons can be obtained, by even the least respectable persons, and many suggestions have been made with the view of preventing "accidents." But the question is not so simple as it seems. Restriction as to the sale of poisons is difficult. Noxious things are among the daily necessities of a civilized community. Phenol, oxalic acid, binoxalate of potash, and others must be retailed to the general public and to the workers in many trades without passing through the cycle of oral and written forms. If it were possible to enact and carry out a very strict Pharmacy Act, a hundred and one arts and industries, from etching on copper to washing linen, would languish. Imagine a Royal Academician desiring to purchase a tube of green paint, and having to give his name and address, to write it in a book, and to state the purposes for which he requires it! What stronger poison is there than tobacco? Half an ounce infused in water would make short work of even an inveterate smoker; but the absurdity of including tobacco in a Poisons Act is too obvious for discussion. Not a few would like to see laudanum and chloral controlled in a much more thorough manner than under the present law, but we are doubtful whether steps in this direction are really practicable. If a person will eat opium or is under the thraldom of chloral no law will prevent him, in any efficient manner, save at the expense of the general community, from purchasing what he requires. If no druggist is to sell more than a grain of opium to one person, the opium eater has but to go to twenty, thirty, or forty druggists until he has accumulated his dose. Some coroners seem to imagine that many suicides would be prevented if common poisons, such as phosphorus paste and the like, were prohibited from being sold at all; but we venture to think, that only that kind of suicide dependent on sudden impulse would be at all influenced by any greater restriction being imposed than at present. There are many doors of death; a man bent on self-destruction, stopped in one direction, succeeds in another. Remove the poison, he cuts his throat with a razor; remove knives and drugs, he suspends himself with his neckcloth.

To sell poison as poison, with a poison label on it, in a poison bottle, is one thing, but to sell it under a fancy name is another. The "soothing syrups," the "cough drops," the "remedies for spasms," the countless pills, elixirs, lotions, drops, and sleeping potions which fill the druggists' shops, and their descriptions the advertising columns of the journals, are so many public dangers. A Lepcha once described the root of a glossy lurid-leaved Himalayan plant as "useful to sportsmen for destroying elephants and tigers, useful to the rich for putting troublesome relations out of the way, and useful to jealous husbands for the purpose of destroying faithless wives." In a similar spirit, looking at the long list of patent medicines of deadly composition, we may describe them as "useful to the insurer of the lives of others, useful to the expectant heir, useful to blight the shame-bud of illicit love, useful to the farmer of babies, and useful to all who have aught human to kill." The "powder of succession" can be bought for thirteen-pence-halfpenny; the "Aqua Toffana" has changed its name to "Somebody's infallible skin remedy;" the venom that smeared the Indian's arrow receives the English Government stamp, and pays the Government duty as a never-failing application for neuralgia or toothache. Let us have done with masks; sell each thing and let it be sold under its own name and no other, let soothing syrup be called "a solution of opium, dangerous to children;" let the exact strength and composition of odontalgic essences, of solutions of aconite, of chloral, etc., be stated on the label, and if wrongly stated let the offender be amenable to law. The time is ripe to say that licensed quackery should no longer be permitted in its present form; but that the ignorant and unscrupulous man who puts chloral solution in a bottle, colours it with cochineal, names it "Somnifer," or anything else that can be registered, and casts it broadcast by means of advertisement over the land, should be held responsible for its use and abuse. So long as the composition of medicines and poisons is known, so long as there is no secresy, then there is fair protection both from accidental admixture and wilful ministration; but the present sale of poisons under the guise of patent medicines is not creditable to our laws, and is alien to our method of thought. We hope that an early effort will be made to take from the speculator and the charlatan the liberty they now possess of pressing the poisoned chalice to the lips of the credulous and simple.

SYRUP OF CALCIUM LACTOPHOSPHATE.*

R. Rother has lately recommended to prepare the above-mentioned syrup by dissolving lactate of calcium with the aid of phosphoric acid instead of following the old plan of dissolving phosphate of calcium in lactic acid, and, owing to the fact that lactate of calcium is not everywhere readily obtained, has proposed a formula which provides for its extemporaneous preparation when the syrup is to be compounded.

The proportions given by the author are such that the relative proportions of calcium phosphate and lactic acid contained in the finished syrup shall be one molecule of the former to six molecules of the latter (instead of four molecules, as it happens to be in the officinal syrup):

Calcium carbonate	150 parts.
Lactic acid, sufficient, or ab. . .	360 ,,
Phosphoric acid, 50 per cent. .	196 ,,
Sugar	6,545 ,,
Water, sufficient to make . . .	10,908 ,,

Mix the lactic acid with 1500 parts of water, and gradually add the calcium carbonate. If the mixture does not become clear, warm it gently and add lactic acid drop by drop, until a transparent solution is obtained. To this add the phosphoric acid previously mixed with 1500 parts of water together with enough more water to make the whole weigh 4363 parts. Then add the sugar, and when this has dissolved, with frequent stirring, filter the syrup through paper.

* From the *American Journal of Pharmacy*, 1883, 607. Reprinted from the *American Druggist*, February, 1884.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 9, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REGISTRAR'S REPORTS.

THE presentation by the Registrar to the Pharmaceutical Council, at its meeting last Wednesday, of his usual Reports on the Registers and on the Numerical Strength of the Pharmaceutical Society enables us, according to our custom for several years past, to complete the statistics commenced in our recent summary of the events of the year 1883, and to estimate the advance or otherwise made by the Society in respect to the fulfilment of its ambition to become more fully representative of the whole body of chemists and druggists. Without referring again to the details as to the examinations it will be sufficient to say that the number of Chemists and Druggists on the Register on the 31st of December, 1883, was 13,665, of whom 2248 were also included in the Register of Pharmaceutical Chemists. These figures show a considerable increase in the number of Chemists and Druggists, but a decrease of 27 in the Pharmaceutical Chemists. Although it will be necessary to use the former of these figures for purposes of comparison, nevertheless, in consequence of the imperfect manner in which the Registrars of Deaths throughout the country carry out the statutory provision as to communicating information of the death of registered Chemists and Druggists, it is impossible to say more than approximately this year what the real number of persons entitled to be on the Register is; but it is certain that the apparent increase will be considerably modified when the Registrar shall again—probably in the course of the present year—exercise the powers conferred upon him for the rectification of the Register.

As to the decrease in the number of pharmaceutical chemists, this is not unanticipated, it being due to a well-recognized cause, which will continue to operate for several years to come. However much it is to be regretted, as narrowing the class competent to become Members of the Pharmaceutical Society, it would be an exaggeration of its signification to look upon it as showing a falling off in the number of persons passing the Major examination; because, as we have pointed out in previous years—and we say it again at the risk of being thought to repeat ourselves—the class is subject to losses from deaths not only among examined men but also among upwards of seven hundred persons included in virtue of having been in business and joined the Pharmaceutical Society upwards of thirty years ago. The fact is that Pharmaceutical Chemists holding the Major certificate continue to increase, the number at the end of last year having been 1547 against 1511 twelve months previously. It follows, therefore, that Major men now constitute 11·32 per cent. of the whole body of Chemists and Druggists. Necessarily the number of persons who have qualified for registration by passing the Minor only has also increased, the number being 3508 against 3287 in the previous return. These two figures give the total number of persons on the Register in virtue of examination, which amounts now to 5055, or 36·99 per cent. of all the Chemists and Druggists in the country. Throwing these figures into a tabular form, for the sake of comparison with previous years, the result is as follows:—

	January 1, 1883.		January 1, 1884.	
	Number.	Per cent.	Number.	Per cent.
Pharmaceutical Chemists:—				
Examined . .	1511	11·24	1547	11·32
Non-examined	764 } 2275	5·68 } 16·92	701 } 2248	5·13 } 16·45
Chemists and Druggists who have passed the Minor only . .	3287	24·44	3508	25·67
Remainder, including those who have passed the Modified . .	7885	58·64	7909	57·88
Total	13,447	100·00	13,665	100·00

The Report of the Registrar as to the numerical strength of the Pharmaceutical Society certainly presents subjects for congratulation; for although it shows a decrease in the number of Members—21 Pharmaceutical Chemists and 17 Chemists and Druggists — the increase in the number of Associates has been more than sufficient to compensate for this in point of numbers. Indeed, not only has the retrogression that was recorded last year been recovered, but the number of registered Chemists and Druggists connected with the Pharmaceutical Society at the end of last year was within six of the highest yet attained, whilst, if Apprentices be included, the highest previous number was considerably exceeded. The decrease in the number of Members, both Pharmaceutical Chemists and Chemists and Druggists, is attributable to causes similar to that previously referred to as affecting the general Register of Pharmaceutical Chemists, and which, indeed, affect the membership of the Society in an even greater degree. But the number of Pharmaceutical Chemists who belonged to the Society as Members at the close of the year was 1882 out of a total of 2248 on the general Register, and it is worthy of notice that although only 55 persons passed the Major examination during the year 1883, 50 Pharmaceutical Chemists were elected Members and 10 restored to membership

during the same time. The Associates in Business numbered 1178, showing an increase of 71 on the previous year, and the Associates 827, showing an increase of 3. The steady increase, year by year, in the important class of Associates in Business is remarkable, and points to the desirability of the provision in the Draft Pharmacy Bill that the passing of the qualifying examination shall constitute eligibility to full membership of the Society. It remains only to say that the number of Apprentices had increased from 1037 to 1098. The figures of the two years may be compared as follows:—

	January 1, 1883.		January 1, 1884.	
	No.	Per cent of whole.	No.	Per cent of whole.
Pharmaceutical Chemists, Members of the Society .	1882	82·72	1861	82·78
Other Registered Chemists and Druggists connected with the Pharmaceutical Society	2710	—	2767	—
Total number of Registered Chemists and Druggists connected with the Pharmaceutical Society. . .	4592	34·15	4628	33·89
Registered Apprentices subscribing to the Society .	1037	—	1098	—

The Registers of Pharmaceutical Chemists and Chemists and Druggists, for 1884, is now ready and copies may be obtained from the Registrar, 17, Bloomsbury Square.

* * *

In the House of Commons, on Thursday, Mr. Warton, according to notice, asked the Secretary of State for the Home Department whether his attention had been called to the case of William Henry John Heath Sheaham, aged seven months, on whose body an inquest was holden on the 31st December, 1883, by Dr. Danford Thomas, and whose death the jury found was caused by the antimony contained in a patent medicine called "Holt's Specific for Whooping-Cough;" whether he was aware that the jury did not (*sic*) desire to call attention to the sale of patent medicines, with a view to legislation on the subject; and whether it was his intention to bring in a Bill to restrict the sale of poisonous patent medicines. The question was replied to by the Vice-President of the Committee of Education of the Privy Council (Mr. Mundella), who said that the attention of the Privy Council had been directed to this and two other similar cases, and that a Bill was under consideration, which would be introduced shortly in the House of Lords, dealing with the whole subject. Mr. Warton's question was no doubt asked as *à propos* of the fact that a "Bill to restrict the Sale of Patent Medicines" had been introduced by him in the House of Commons on the previous evening and read a first time. This Bill has not yet been printed, but the second reading is set down for the 26th of March.

* * *

A Bill dealing with this subject has been introduced into the United States House of Representatives containing provisions that appear to have disturbed the equanimity of transatlantic patent medicine dealers. It proposes to make it illegal for the post office authorities to include in the mails any advertisement or advertising device of "any medical preparation, compound or prescription, or any punch, bitters, cordial or similar compound or preparation to be used as medicine or mixed with food, liquor, wine or any other substance used as a beverage or as food or medicine," until the exact formula for the preparation of the article advertised has been deposited, together with a sample, in the Patent Office, and a certificate has been issued by examiners appointed for the purpose that the article is not noxious or dangerous to health. As such a provision, if carried out stringently, would exclude nearly all newspapers from postal privileges or necessitate a radical alteration in their advertising columns involving, it is estimated, a probable annual loss to the proprietors of at least a million sterling, it will be interesting to observe the attitude of the public press in the States towards the Bill.

* * *

A Bill providing for the registration of firms and of persons carrying on business under names and styles other than their own was read a first time in the House of Commons on Wednesday last, and the second reading is set down for the 3rd of March. The Bill was brought in by Mr. Norwood.

* * *

The new Rules for the Registration of Trade Marks, with Classification of Goods and Table of Fees, were on Tuesday, in accordance with the terms of the Patent Act, laid before Parliament. It may be useful to state that a pretty full abstract of this paper is printed in the new Calendar of the Pharmaceutical Society.

* * *

A curious case, involving the question as to how far unqualified persons can hold property in pharmacies in France, has been recently before the Cour de Paris. It seems that a pharmacien who had opened a pharmacy, not being successful, disposed of the business to a company, including unqualified persons, by whom he was employed as manager. This mode of carrying on a pharmacy was, however, objected to by the Société de Prevoyance des Pharmaciens de la Seine, which, more fortunate than the Pharmaceutical Society in this country in similar circumstances, succeeded in obtaining a legal judgment which put a stop to it. The baulked company then proceeded to dispose of the business to a pharmacien, but here the creditors of the founder of the establishment intervened, and on the plea that as the company could not legally carry on the business the first sale was not a valid one claimed the business as part of the defaulter's estate. This claim has not been allowed by the Court, and it would, therefore, appear that in France an unqualified person may become the proprietor of a pharmacy, but that whilst it continues in his possession the business must not be carried on.

* * *

The enormous proportions attained by the glucose industry in the United States, and probably some disquieting rumours that have found currency concerning the wholesomeness of the product, appear to have induced the American Commissioner of Inland Revenue to ask the aid of the National Academy of Sciences in investigating the subject. The Academy entrusted the inquiry to a Committee, which has recently reported its opinion that the processes at present employed in the manufacture of sugar from starch are unobjectionable and leave the product

uncontaminated; that the starch sugar thus made and sent into commerce is pure and uniform in composition and contains no injurious substances; and that although possessing, at most, only two-thirds of the sweetening power of cane sugar, nevertheless, starch sugar is not inferior to it in healthfulness, no evidence having been met with that maize starch sugar, either in its normal condition or when fermented, has any deleterious effect upon the constitution even when taken in large quantities.

* * *

In a paper contributed to the new number of the *Journal de Pharmacie*, M. Lepage mentions that in the performance of his duties as an inspector of pharmacies he has frequently met with specimens of aqueous extract of cinchona which failed to give evidence of containing more than traces of alkaloid. Seeking an explanation he found that in order to meet a requirement on the part of certain physicians that the extract should be completely soluble in water it was frequently prepared with cold water instead of the boiling water ordered in the Codex. In a similar manner the alcoholic extracts of belladonna and henbane are said to be supplanted by what are really aqueous extracts, containing hardly any alkaloid.

* * *

According to *Nature* it was announced at the last meeting of the Vienna Physical Society that Professor von Wroblewski has succeeded in effecting the solidification of hydrogen.

* * *

The gold medal offered annually by the Paris Society of Pharmacy for the best thesis on a subject belonging to natural or chemical science has recently been awarded to M. Anthoine for a memoir on "The Anhydrides and Mixed Anhydrides of Acetic Acid and Chlorated Acetic Acids."

* * *

The *Bulletin Commercial* publishes a curious genealogical fragment, based upon extracts from municipal archives, showing that during six consecutive generations of a family named Baudot, the occupancy of a pharmacy in Langres (department of Haute-Marne) has passed from father to son without any break. The family occupation extended over nearly two centuries.

* * *

We regret to say that information has been received of the death on the 28th of January, from bronchitis, of Mr. Henry Edward Davies, who was elected an annuitant in 1883.

* * *

The Third Junior Pharmacy Ball took place at Willis's Rooms, on Wednesday last, and was in every respect successful, the company numbering about three hundred and sixty. The toasts were proposed by Professor Attfield, F.R.S.

* * *

The annual dinner of the Chemists' Assistants' Assoeiation is to take place at the Holborn Restaurant on Wednesday, February 20. S. R. Atkins, Esq. (Vice-President of the Pharmaceutical Society), in the chair. Information as to tickets, which should be applied for at once, will be found in an advertisement on another page.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, 13th inst., at 9 p.m., when a paper on "The Human Eye" will be read by W. J. Frankish, Esq., M.R.C.S.E.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, February 6, 1884.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Messrs. Andrews, Bottle, Butt, Churchill, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Squire, Symes, Williams, Woolley and Young.

The minutes of the previous meeting were read and confirmed.

Members of the Council who Retire.

The lot having been taken in the usual manner to determine the seven members of the Council who should retire in May next, the following names were drawn:—

Atkins.	Radley.	Savage.
Borland.	Robbins.	Woolley.
Butt.		

The following, who remained in by lot last year, now retire by rotation:—

Churchill.	Schacht.	Williams.
Gostling.	Squire.	Young.
Greenish.		

The following remain in office another year:—

Andrews.	Hampson.	Richardson.
Bottle.	Hills.	Symes.
Carteighe.		

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following pharmaceutical chemists, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Allsworth, Norman .....London.
Dymond, Thomas Southall.....Enfield.
Gulliver, Walter Frederick.....London.
Ivatt, Albert.....Cambridge.
Jones, Frank.....Royton.
Jones, William .....London.
Longtoft, William .....London.

Chemists and Druggists.

The following registered chemists and druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Brookes, George .....Llandudno.
Robb, John .....Cardiff.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society.

Minor.

Bradford, George Henry .....Bridlington Quay.
Hill, Richard Mainprize .....Scarborough.
Innes, David.....Stalybridge.
Penberthy, Henry Broad .....Sidmouth.
Quick, William Thomas .....Lympstone.
Sanderson, Edward John .....Hazel Grove.
Winter, Joseph .....Llandudno.

Modified.

Bottomley, Lawrence W. .....South Shields.
Bush, William .....London.
Castell, George Gower.....Sydney, N.S.W.
Phillips, Charles .....Birmingham.
Strode, Thomas .....London.

ASSOCIATES.

The following, having passed the Minor examination and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Buchanan, John .....Bonnyrigg.
Cairns, John .....Kelso.
Coats, John Thomson .....Edinburgh.
Dorning, Herbert Rigby.....Chorley.
Flett, Arthur .....Edinburgh.
Harrison, John.....Lincoln.
Hogg, Henry Scott .....Glasgow.
Jack, James .....Arbroath.
Mackenzie, James Calder .....Grantown.
Millhouse, Edward .....Grantham.
Smith, Charles Albert .....Leeds.
Steward, Josiah William.....Bridgnorth.
Tookey, Edwin James.....Birmingham.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Adams, Anthony Allan .....Salcombe.
Anderson, James Grant .....Aberdeen.
Andrew, John Herbert .....Oldham.
Arnold, John Julius .....Brighton.
Atherton, Henry C.....Tunbridge Wells.
Atkinson, William George.....Ulverston.
Baker, Sidney George .....High Barnet
Baker, Walter James .....Dorking.
Barker, George.....Mirfield.
Bowie, Alexander... .....Kincardine.
Brook, Thomas Turner .....Elland.
Brown, George Henry .....Gravesend.
Burden, Chas. Hy. Brown .....Bude.
Carter, Benjamin.....Falmouth.
Clarke, William Ernest .....Aberystwith.
Clayton, William Arthur.....Sheffield.
Cleghorn, James .....London.
Cox, Charles Earnshaw .....Doncaster.
Croxford, William Charles.....Brentford.
Davenport, Richd. Cartwright...Talgarth.
Davies, Charles Gardiner .....London.
Dryden, Thomas .....Landore.
Dunn, George Marchant.....London.
Eatough, Nicholas William.....Blackburn.
Essery, William George .....Plymouth.
Fish, Benjamin, jun. .....Barrow-in-Furness.
Forby, Archibald.....Downham Market.
Fowle, Sydney .....London.
Francis, James B. ....Wrexham.
Freshney, John William S.....Lincoln.
Gibson, William Thomas.....Collingham.
Gott, Alfred Thomas .....Bradford.
Gray, Alfred Francis .....Leicester.
Gregory, George Henry .....Lincoln.
Griffiths, Charles Henry .....Manchester.
Hanson, Arthur .....Queensbury.
Hickinbottom, John William...Sleaford.
Higson, John Russell .....Ruthin.
Hislop, James Andrew .....Hawick.
Hoblyn, Edward Robert.....Exeter.
Hooper, William Henry ....Okehampton.
Jenkins, Thomas .....Aberdare.
Johnson, Frederick David .....Beverley.
Jones, Thomas .....London.
Jopling, William .....Bishop Auckland.
Kidd, George Thomas .....Stowmarket.
Lakeman, Nicholas Frank .....Modbury.
Lawton, Charles Edward .....Lockwood.
Madge, Thomas William .....Shaldon.
Manley, William James .....Torquay.
Mills, George ....Southsea.
Morgan, William Thomas .....Llandovery.
Morris, Caleb Gwion .....St. Clears.
Newbould, Victor Emanuel ...Sutton.
Newman, Richard Seymour ...Hanley.
Nicholson, John .....Broughton-in-Furness.
Pain, Percy .....Cambridge.
Parkinson, William .....Blackburn.
Perren, Herbert Joseph .....Brighton.
Phillips, Daniel .....London.
Phillips, George .....Dowlais.
Pimm, Henry Arthur .....Torquay.
Pollard, Walter Henry .....Reading.
Prentice, Bertram .....Edinburgh.
Ralling, Ernest Lewis .....Colchester.
Retallack, William Cyrus .....St. Austell.
Robertson, George .....Bridge of Allan.
Shaw, Harry.....Wakefield.
Simpson, Frederick Charles ...Pershore.
Smith, John Henry .....Coventry.
Southwell, Charles Bullock.....Bridgnorth.
Spratling, Walter.....Boston.
Spry, Richard .....London.
Spurway, Edgar .....Kidderminster.
Stevens, Arthur .....London.
Stewart, Robert McAll .....Penryn.
Taylor, William C. C. .....Saltburn-by-Sea.
Taylor, William Edward.....Basingstoke.
Thornhill, Ernest .....Brighton.
Williams, William .....St. Clears.
Willson, John Wherry.....Peterborough.
Wilson, John.....Aberdeen.
Wilson, Kendrew John .....Thirsk.
Woolley, Edward James.....Manchester.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

RESTORATIONS TO THE REGISTER.

The names of the following persons, who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

James Palliser Douglas, 99, East Street, Southampton.
Willam Hudson, The Willows, Upper Mitcham, Surrey.

THE REGISTRAR'S REPORT.

The usual report by the Registrar upon the numerical strength of the Society, the statistics of the examinations and the Registers, was laid upon the table and ordered to be published. The report is printed on pp. 632 and 633.

REPORTS OF COMMITTEES.

FINANCE.

Upon the motion of the President, the report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

Mr. SCHACHT congratulated the Council that the President had arranged to take the chair on the previous day at the meeting of this Committee, and had thus conveyed to the Committee his approbation of the suggestion recently made that the President or Vice-President should take the chair at all meetings of the Finance Committee. It occurred to most then present that it was very desirable, if the President could make it convenient to do so, that he should take the chair, because he could carry on with more perfect continuity than any one else the story of the expenditure of the Society. Many reasons might be mentioned for the desirability of this arrangement, but he would only mention one, viz., that from time to time many questions of expenditure came forward which had to be dealt with on the authority of the President in the first instance; they would come before the Committee afterwards, and it was very desirable that the President should be present and give such explanations as might appear necessary. Hitherto the President had generally given his attention to the

Benevolent Fund Committee, which sat at the same time, but it appeared to him that that Committee might be quite as well presided over by the Vice-President.

The PRESIDENT said he had no doubt that the Vice-President and himself would be able to arrange satisfactorily for the work of these two Committees.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to a former member, aged 68 (who has had nine previous grants), suffering from chronic disease. Sussex.

£10 to the widow of a registered chemist and druggist, aged 38. Applicant had £10 in February, 1883. Husband died in 1882 leaving her with seven young children, one of whom has since died. Essex.

£5 to the widow of a registered chemist and druggist, aged 60. Applicant has had four previous grants, is in ill-health and dependent for support upon two sons; has also two daughters. Middlesex.

£10 to a registered chemist and druggist, aged 74. Had a grant of £10 in May last. Too old and feeble to earn anything. Sussex.

Several other applications had been received, which the Committee declined to entertain.

The Secretary had reported that he had expended fifteen out of the twenty guineas granted last month for the purpose of securing the election of a child to the London Orphan Asylum, and had been successful. The death of Mr. Davies, one of the annuitants, had been reported.

The Council went into committee while an explanation was given as to one of the applications which had not been entertained. In the course of the discussion which ensued, several members commented on the new regulations introduced with regard to signing the papers of application, the opinions expressed being very divergent. The only point necessary to refer to is one mentioned by Mr. Butt, viz., that applicants should not rest satisfied with the two signatures actually required, but should get their applications supported as influentially as possible.

On resuming, the report and recommendations were, on the motion of the Vice-President, unanimously adopted.

Donations to the Benevolent Fund.

The PRESIDENT announced the receipt of the following handsome donations:—

Mr. Buck, Stamford Hill, £105.
Miss Humpage, in memory of her late father, Mr. Benjamin Humpage, Chiswick, £50.
Mr. Charles Maw, Aldersgate Street, £105.
Mr. C. T. Maw, Aldersgate Street, £26 5*s*.

The special thanks of the Council were voted to the donors.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Library.

The report of the Librarian had been received, including the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
December	Day	328	26	2	14
	Evening	138	20	4	9
Year 1883.	Day	6011	40	0	20
	Evening	1764	20	1	8

Circulation of books.	No. of Entries. Town.	Country.	Total.
December	130	92	222
Year 1883	1866	1374	3240

Carriage paid.	£	*s.*	*d.*
December	1	6	11
Year 1883	20	4	2½

The undermentioned donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Eder (J. M.), The Chemical Effect of the Spectrum, 1883. From Capt. ABNEY [?].
Society of Medical Officers of Health, Transactions, 1882–3. From the SOCIETY.
Meyer (A.), Handbuch der qualitativen chemischen Analyse, 1884. From the AUTHOR.
Attfield (J.), Chemistry, 10th [U. S.] ed., 1883. From the AUTHOR.
Gay (H. F. F.), Étude Micrographique et Spectroscopique des Teintures et des Alcoolatures et en particulier des Teintures d'Opium, 1883. From Professor SOUBEIRAN [?].
Companion to the British Homœopathic Pharmacopœia, 2nd ed., 1883. From Messrs. KEENE and ASHWELL.

The Committee recommended the purchase of the undermentioned works:—

Bleaching, Dyeing, and Calico Printing (Churchill's Technological Handbooks), 1884.
Kohlrausch (F.), Introduction to Physical Measurements, 1883.
Kilner (W. B.), Compendium of Modern Pharmacy, 5th ed., 1884.

Curator's Report.

The Curator had reported the attendance in the Museum to have been:—

	Total.	Highest.	Lowest.	Average.
Morning	399	37	2	18
Evening	110	16	0	5

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimens of Hydroxylamine, Hydroxylamine Hydrochloride and Hydroxylamine Sulphate. From Mr. W. H. INCE.
Specimens of Chian Turpentine and Mastic from the Island of Scio, a fine specimen of Gum Arabic and of Scammony Resin. From Mr. ZANNI, of Constantinople, presented through Mr. T. GREENISH.
Specimens of Paraffinum Solidum, and Paraffinum Liquidum, Unguentum Paraffinum, and Adepsine. From KARL HELLFRISCH and Co., Offenbach-on-the-Maine.
Specimens of the seeds of Cassia occidentalis and of a root from Africa resembling Pareira Brava. From Mr. G. C. MACWILLIAMS.
Specimens of Tinguaciba Bark and of Bark of the Balsam of Peru tree. From Messrs. T. CHRISTY and Co.

A letter had been received from the Superintendent of the Royal Botanic Gardens, Calcutta, reporting the dispatch of further specimens of cinchona bark, analyses of which were enclosed.

The Professors had reported satisfactorily of their respective classes.

The Committee had considered the question of securing additional premises in Edinburgh, the accommodation being insufficient on examination days, and recommended that a suitable house be secured at the first convenient opportunity.

The PRESIDENT, in moving the adoption of the report, having referred to the value of the specimens of bark which were being presented to the Society, suggested that the Council should go into committee for the purpose of considering the last paragraph of the report, referring to the premises of the North British Branch.

This being acceded to,

The PRESIDENT explained in detail the reasons which had weighed with the Committee in the recommendation it had made. He stated that the present premises in George Street, though in many respects suitable, were defective in regard to the approach, and also in sanitary arrangements, which on days of examination was found very inconvenient. It had been suggested that it would answer the purposes of the Society better to purchase a house suitable to its requirements, and inquiries having

REGISTRAR'S REPORT.

MEMBERS, ASSOCIATES, AND APPRENTICES OF THE SOCIETY FOR THE YEAR 1883.

	Life Members.		Subscribing Members.		Associates in Business.	Associates not in Business.	Apprentices.
	Pharmaceutical Chemists.	Chemists & Druggists.	Pharmaceutical Chemists.	Chemists & Druggists.			
Number in 1882	236	2	1646	777	1107	...	..
„ restored, 1883 ...	...	...	10	2	5	...	...
„ elected, 1883 ...	...	...	50	14	138	...	...
	236	2	1706	793	1250	...	...
Deaths, Secessions, etc. ...	7	...	74	33	72	...	...
Total Strength of the Society	**229**	**2**	**1632**	**760**	**1178**	**827**	**1098**
Summary:—							
1882	236	2	1646	777	1107	824	1037
1883	229	2	1632	760	1178	827	1098
Increase	...	...	...	...	71	3	61
Decrease	7	...	14	17	...	...	...

COMPARATIVE STATEMENT OF THE NUMERICAL STRENGTH OF THE SOCIETY FOR 5 YEARS: 1879-83.

MEMBERS.—PHARMACEUTICAL CHEMISTS.

	1879	1880	1881	1882	1883
Restored to Membership ...	7	4	5	8	10
Elected „ ...	67	65	62	35	50
(Total additions) ...	74	69	67	43	60
Deaths, Secessions, etc. ...	91	82	101	92	74
Decrease ...	17	13	34	49	14
Total Number of Subscribing Members	**1742**	**1729**	**1695**	**1646***	**1632**

MEMBERS.—CHEMISTS AND DRUGGISTS.

	1879	1880	1881	1882	1883
Restored to Membership ...	1	2	3	3	2
Elected „ ...	19	24	18	15	14
(Total additions) ...	20	26	21	18	16
Deaths, Secessions, etc. ...	33	35	38	27	33
Decrease ...	13	9	17	9	17
Total Number of Subscribing Members	**812**	**803**	**786**	**777**	**760**

ASSOCIATES IN BUSINESS.

	1879	1880	1881	1882	1883
Restored	3	5	2	4	5
Elected	133†	137	131	115	138
(Total additions) ...	136	142	133	119	143
Deaths, Secessions, etc. ...	70	82	89	81	72
Increase ...	66	60	44	38	71
Total Number of Associates in Business...	**965**	**1025**	**1069**	**1107***	**1178**

ASSOCIATES NOT IN BUSINESS.

	1879	1880	1881	1882	1883
Increase ...	19	13	...	7	3
Decrease ...	...	...	23	...	...
Total Number of Associates not in Business	**827**	**840**	**817**	**824**	**827**

APPRENTICES OR STUDENTS.

	1879	1880	1881	1882	1883
Increase ...	31	3	...	...	61
Decrease ...	...	...	28	9	...
Total Number of Apprentices or Students	**1071**	**1074**	**1046**	**1037**	**1098**

LIFE MEMBERS.

	1879.	1880.	1881.	1882.	1883.
Pharmaceutical Chemists	**241**	**237**	**238**	**236**	**229**
Increase	...	...	1	...	...
Decrease	2	4	...	2	7
Chemists and Druggists	**2**	**2**	**2**	**2**	**2**

* 1 who paid as an Associate in Business, afterwards passed the Major, and was elected a Member.
† 134 were elected, but 1 afterwards passed the Major, and was elected a Member.

ANALYSIS OF EXAMINATIONS FOR THE YEAR 1883.

FIRST OR PRELIMINARY EXAMINATION

Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year	Average Number of Candidates at each Examination.	Average Number of Rejections at each Examination.	Percentage of Rejections.
1539	770	769	4	384·75	192·25	49·96

MAJOR, MINOR, AND MODIFIED EXAMINATIONS.

ENGLAND AND WALES.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 26
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 15·38

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	100	50	50	6	16·66	8·33	50·0
Minor	632	235	397	6	105·33	66·16	62·8
Modified	9	6	3	4	2·25	·75	33·3

SCOTLAND.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 12
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 8·5

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	11	5	6	4	2·75	1·50	54·54
Minor	134	59	75	4	33·50	13 75	55·97
Modified	1	1	0	1	1·00	0·00	00·0

THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS, 1883.

Additions during the year:—

Number of persons who have passed the—		
Modified Examination		7
Minor „		294
Major „	55*	
Number of persons registered on payment of the Registration Fee, having been in business before August 1, 1868.....		14
Number of persons restored to the Register on payment of a fine		18
Placed on the Register by virtue of restoration to membership—Pharmaceutical Chemists .		5
		338

* These having already been included in the number who passed the Minor, do not increase the numbers on the Register.

Erasures during the year:—

Deaths:—		
Notices from Registrars		138
Other sources		60
Erased at the request of registered persons themselves.....		7
Increase of numbers on the Register.		133
		338

Number of Pharmaceutical Chemists on the Register, December 31st, 1882 2,248
„ „ Chemists and Druggists 11,417
13,665

been made, it was found that the Society would be put to little or no extra expense by so doing; whilst if a larger house than was at present requisite were acquired, no difficulty would be found in sub-letting a portion of it.

Mr. YOUNG gave further information of a similar character.

On resuming, the report and recommendations of the Committee were received and adopted unanimously.

GENERAL PURPOSES.

The report of this Committee included the usual letter from the Solicitor, reporting upon the progress of cases in his hands. In most cases great difficulty had been found in obtaining the evidence required. Two other cases of alleged infringement of the Pharmacy Act had been considered, and it was recommended that the Solicitor be instructed to commence proceedings.

The Council went into committee to consider the report.

On resuming, the report and recommendations of the Committee were received and adopted.

LAW AND PARLIAMENTARY.

The report of this Committee stated that at the last meeting the President and Vice-President of the Chemists and Druggists' Trade Association had been present by invitation when the provisions of the Bill were discussed and explained. The Secretary had been subsequently directed to write to the Secretary of the Trade Association, inviting the Executive to appoint a small deputation to join one from the Council in waiting on the Lord President of the Privy Council. A reply had been received stating that the matter would be brought before the Executive of the Trade Association at its next meeting on the 8th inst.

The Council went into committee to discuss the report.

On resuming, it was received and adopted.

REPORT OF EXAMINATIONS.

January, 1884.

SCOTLAND.

	Candidates.		
	Examined.	Passed.	Failed.
Minor (22nd)	14	8	6
„ (23rd)	14	10	4
„ (24th)	13	9	4
	—41	—27	—14

PRELIMINARY EXAMINATION.

	Candidates.		
	Examined.	Passed.	Failed
January 8th.	278	127	151

Six certificates received in lieu of the Society's Preliminary examination.

1 College of Preceptors.
3 University of Cambridge.
2 „ „ Oxford.

Mr. SCHACHT said some figures had been put into his hands with regard to the last Preliminary examination, to which he should like to call attention. They showed that the examination was extremely exact for its purpose, inasmuch as a candidate whose general education had been good, who had been well trained, but who went in for this examination without any sort of special training, succeeded in obtaining nearly the maximum number of marks.

Mr. HILLS was much interested in this report (published on p. 613), but regretted to find that arithmetic was still the plucking subject. He considered it the most important subject of the three, seeing how requisite it was that prescriptions should be exactly dispensed, even from the point of view of the safety of the public. He found that out of 151 failures no less than 65 were in arithmetic alone.

CORONER'S JURIES.

The PRESIDENT said the Council had no doubt read a note in the Journal containing some strong statements made at a coroner's inquest with regard to the exemption of pharmaceutical chemists from service on such juries. Without going into details he might say that on his attention being called to the subject he at once communicated with the Solicitor, who, subsequently, had an interview with the Coroner, and there was every reason to hope that the contingency referred to would not arise. Of course he would not assert anything positively, but the opinion of the Solicitor was, that in the case of pharmaceutical chemists the exemption was complete, and if any pharmaceutical chemist should get into any difficulty on this point he hoped he would at once communicate with the Secretary.

Mr. SAVAGE said he had written to the gentleman referred to on seeing the report in the local paper, telling him that it was his duty to see that his name was not included in the list of persons liable to serve on juries.

The PRESIDENT remarked that coroners did not summon by any jury list; they could summon any householder, or even a person in the street, if necessary; but in the case of pharmaceutical chemists the exemption clause contained the words "all inquests whatsoever," and they claimed to be exempt. He would therefore mention that pharmaceutical chemists were exempt, not for their own personal convenience, but that the safety of the public might not be endangered during their absence from their pharmacies.

Mr. ANDREWS said he was summoned a short time ago on an inquest and the coroner told him that he did not read the Act in the same way as he (Mr. Andrews) did. On that occasion he remained at the request of the coroner as a matter of courtesy; but there was no doubt that coroners did not consider that their courts were governed by the same rules as applied to ordinary jury service.

The PRESIDENT said that was quite correct; and, curiously, the exemption of medical men, solicitors, barristers and others, only extended to ordinary juries; but in the case of pharmaceutical chemists and solicitors' clerks the clause contained the words "all inquests whatsoever," and he, therefore, thought they were exempt from service.

ADDENDUM.—Page 612, col. i, line 6, in the list of examiners present at the meeting of the Board in Edinburgh, *after* Gilmour, *insert* Kinninmont.

EVENING MEETING.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT, IN THE CHAIR.

The Fourth Evening Meeting of the Session was held, on Wednesday, February 6, the chair being taken at half-past eight o'clock.

The minutes of the previous meeting were read and confirmed.

Two papers were then read, constituting Parts IV. and V. of a Report on the Pharmaceutical Preparations of Nux Vomica, which were entitled—

IV. THE PREPARATION OF A STANDARD EXTRACT OF NUX VOMICA.

V. THE PREPARATION OF A STANDARD TINCTURE OF NUX VOMICA.

BY WYNDHAM R. DUNSTAN AND F. W. SHORT.

The papers are printed on pp. 621 and 622, and gave rise to the following discussion:—

The VICE-PRESIDENT said that the papers had struck him as essentially valuable on account of their practical nature. However important it was that, at times, they should pass into the region of abstract speculation and original research in pure chemistry, he took it that it was highly important in that room that they should have papers which were essentially practical. It further occurred to him that the papers were a very valuable contribution upon the subject of preparations of absolutely

definite or standard strength. They had been going on in the belief that the preparations which they had been dispensing had approximated to a greater degree of uniformity than they evidently possessed. The authors set forth a by no means difficult process by which they could obtain an extract containing a total of 15 per cent. of the alkaloids strychnine and brucine and a standard tincture containing 1 grain of total alkaloid to the ounce. The obtaining of such preparations was in itself an important contribution to pharmaceutical science.

Mr. SCHACHT said that within the last few weeks it had been his duty, in the ordinary course of business, to prepare a fresh batch of the extract of nux vomica and he had availed himself of the valuable suggestions contained in previous papers written by the same authors. Instead of using pure spirit, he had employed the proportion of spirit and water which they had recommended as the best solvent for the powerful ingredients of nux vomica. He operated upon a quantity of seven pounds of nux vomica, and he proceeded by the old-fashioned process of softening the material by steam and then drying it and putting it into a mill and grinding it. By this means he easily obtained a very nice powder, and this was exhausted by percolation in the most simple of all apparatus. The percolation was continued until there was no sign of colour, or very little. His experience had differed somewhat from that of these extremely careful experimenters. He had found that something like 43 pints of the diluted alcohol were required to exhaust the 7 pounds of nux-vomica. That the materials were thus very nearly exhausted he found by putting them afterwards into boiling alcohol, and thoroughly boiling them, the result of which process was that he got only 3 drachms more out of the whole 7 pounds. The operation yielded 36 pints of tincture, and that being evaporated under conditions for saving the spirit yielded him ultimately 14 ounces of extract. Unfortunately, the process was not completed until Friday last, and the time which had elapsed since had not sufficed for him to be able to ascertain the proportion of alkaloids in a satisfactory way. He almost thought that a larger proportion would be yielded than Mr. Dunstan had found in the other cases. If it was true that nux vomica contained nearly 3 per cent. of total alkaloids, 7 pounds ought to yield about 3·42 ounces total alkaloids. If the extract contained the whole, then 14 ounces ought to contain 3·42 ounces of alkaloid, nearly 3½ ounces, which was about 24 per cent., and therefore a good deal more than 15 per cent. He had no intention of criticizing the results in the paper. They were, no doubt, extremely accurate, but he should like the authors to say whether the practical experiments of a commonplace pharmacist corresponded with their own. Mr. Dunstan had a proper anxiety to indicate a standard strength for the extract, but if he took a certain quantity of tincture of known alkaloidal value and evaporated it to an extract which should have a strength corresponding to a standard, how did he manage when he got it to that condition beyond which it must not be evaporated? He might add something to dilute it, but that would be the admission of a practice which he (Mr. Schacht) should not like to encourage. The dilution of a specific preparation seemed to be a dangerous thing to admit with authority. On the other hand, supposing that the extract, when prepared by commonplace pharmacists, contained 20 per cent., he should like to know what right anybody had to say that it should contain only 15. He must ask that the question of the standards be an open question. Again, supposing that the extract contained even 15 or 20 per cent., he thought that the Pharmacopœia authorities ought to modify in another edition that portion of the book which gave the doses. The Pharmacopœia declared a dose of extract of nux vomica to be from ½ a grain to 2 grains; but 2 grains of an extract, which contained 20 or 24 per cent. of strychnine and brucine, was a little outside what it was wise to prescribe upon authority.

Mr. MARTINDALE said that he supposed that the papers were written in prospect of the introduction of a new Pharmacopœia. The standard strength which Mr. Dunstan proposed was that of 1 grain to the ounce. He (Mr. Martindale) had hoped that they were coming somewhat more nearly to the metrical system. One grain to the ounce was not a good proportion. He recommended 1 in 500, or something like that. In the new Pharmacopœia they ought to approximate more nearly to a scientific scale of weights and measures rather than continue the old system.

Mr. ROBBINS said that in reading the paper he had thought that a smaller quantity of spirit might be employed. He had found in practice that less than the usual quantity might be used. If he had been going to make the experiment of Mr. Schacht he should have divided the nux vomica into four parts, and placed each part in a separate percolator. After passing a relatively small quantity of menstruum through the first percolator he would use the percolate as a menstruum for the second, and so on until practical exhaustion was effected. The advantage of adopting the method which he advocated was that in the case of many substances almost a fluid extract would be obtained at the beginning, and all that would be wanted would be to get out the washings carefully from the different percolators. That being a solution which did not contain a very large quantity of extract it could be evaporated by itself, and the whole extract would be produced almost without any heat at all. By this process a very much smaller than the usual quantity of spirit would be sufficient. He adopted the process many years ago, and he had always found it successful.

Mr. GILES said that experience had taught him that a discussion on percolation was very much like percolation itself; it went on for ever. As to the details of the paper, he thought that it was relatively excessively immaterial whether the standard taken was 15 or 25 per cent., and whether they adopted the metrical system or the old system of ounces. But he did think that there was something in the paper which marked it as an era in pharmacy. It was the first overt step which had been taken in the direction of standardizing the important pharmaceutical preparations to which allusion had been made. It required very little prescience to foresee that the special feature of pharmacy in the future would be the standardizing of its preparations. Medical science had become more scientific, and in becoming more scientific it had become more exact; and it demanded a corresponding precision on the part of pharmacy. If pharmacists failed to supply that demand, they must consent to admit themselves a failure; and he believed that the consequences would be that medical practitioners would be thrown back, in spite of themselves, upon the alkaloids, although he and most practitioners believed that the pharmaceutical preparations of the drugs were more efficacious than the alkaloids. If that was done, it would, he thought, amount almost to the abolition of pharmacy, and in the place of pharmacists there would be mere dispensers of drugs who would be simply carrying on the most mechanical and the least honorable parts of the functions of pharmacists, namely, the dispensing of medicines from things which they had bought elsewhere. He thought that that would be very much to be deplored, and that the Society ought to encourage in every way measures which would tend to prevent that result, and unquestionably the development of the idea of standardizing pharmaceutical preparations was a means by which that should be achieved. He was sure that they would feel that it was a very satisfactory thing to have had a series of such excellent papers which had culminated in the very practical one which had been read that evening. The papers which had been brought forward lately had been produced by the alumni of the Society. He trusted that, quite independently of any organization or anything else, there might be a prosecution of further research in the same

direction by Mr. Dunstan and his very able and careful coadjutors. He did not know that anything had given him greater pleasure than seeing the subject taken up in such a masterly way, and pursued with so much perseverance as was exhibited in the present series of papers. He had no doubt that the present paper would make its mark in pharmacy, and that the result of it would be seen in some shape or form in the forthcoming edition of the Pharmacopœia.

Mr. BLAND asked whether there was any means of getting rid of the fixed oil which extract of nux vomica contained. He had found it to be a great nuisance. He believed that it was one of the principal causes of the greasy deposit which was generally found in the bottles if the tincture was kept.

Mr. GREENISH said that he concluded that Mr. Dunstan used the powdered nux vomica of commerce.

Mr. DUNSTAN: Yes.

Mr. GREENISH, continuing, said that Mr. Schacht appeared to have ground the nux vomica for himself. That being the case, he should quite expect that Mr. Schacht's result would be a larger quantity of extract than Mr. Dunstan obtained. He could not regard the powdered nux vomica of commerce as the best form from which to prepare the extract.

Mr. TANNER said that he had long regarded the powdered nux vomica of commerce as being a true and genuine article. Mr. Schacht obtained something over 10 per cent. of extract. He (Mr. Tanner) generally obtained 10 per cent. of extract in operating by the Pharmacopœia process upon powdered commercial nux vomica. This quantity agreed very closely with what Mr. Schacht obtained from the material he ground himself. With regard to the adoption of the metrical system, 1 grain to the ounce, taking the specific gravity of nux vomica, was not very far from a quarter per cent., and, therefore, it would be easily expressed metrically.

Mr. GROVES said that it was very important that so dangerous a body as nux vomica should become the subject of titration. The doctors in his neighbourhood did not demand titrated drugs. Perhaps in this enlightened centre there was some demand for them. It seemed to him that the only way of titrating a body to obtain a standard article would be to prepare two substances, one decidedly above the standard and one decidely below, and then, after arithmetical calculation, to mix the two to bring the bulk to the proper standard. The paper did not discriminate between the strychnine and the brucine; it simply indicated the total alkaloids. He did not think that the object in view would be gained until such a discrimination was made. He might be allowed to express his sincere admiration of the labours of the authors. They had brought great credit to themselves and shed a lustre on the School of the Society.

Mr. SCHACHT said that he took no means whatever to separate the fat; but it must be remembered that he made his preparation with a spirit which was not quite as strong as the Pharmacopœia directed.

Mr. DUNSTAN, in reply, expressed his gratitude for Mr. Schacht's elaborate criticism, because it came from such a distinguished practical pharmacist. With regard to the percentage of alkaloid in the extract, he must know how much alkaloid was contained in the nux vomica or in the percolate before he could say what would be the probable amount in the extract. He should predict that the extract would contain about 15 per cent., but he would very gladly assay it for Mr. Schacht. Nux vomica beans usually contained from $2\frac{1}{2}$ to 3 per cent. of alkaloid. The Bombay beans contained from $3\frac{1}{2}$ to 4 per cent., but they very seldom came into retail pharmacy. Mr. Schacht had used much more spirit than was recommended in the paper. Nux vomica was not a very expensive substance, and Mr. Short and he had thought that the leaving in of a grain or a grain and a half of the alkaloid was not a very important matter. The fourth fraction mentioned in the paper yielded 3 grains of total alkaloid. The fifth fraction would have given still less. There was no objection to the use of more spirit except on grounds of economy. Mr. Schacht had asked what was to be done when, after evaporation, the extract was too strong in alkaloid. Mr. Short and he had noticed in preparing extracts that the proportion of extractive matter to alkaloid appeared to be fairly constant in different specimens of nux vomica containing varying amounts of alkaloid, so that the standard extract was never too soft or too hard for use.

Mr. SCHACHT asked how they stopped at the exact moment when the extract contained the proper amount of alkaloid. The extract might be too soft.

Mr. DUNSTAN said that, practically, that would never take place if their directions were followed. The finished extracts contained exactly the same amount of alkaloid, and if their process were followed, would never be too soft.

Mr. GILES said he understood that Mr. Dunstan found that some nux vomica contained 3·3 per cent. of alkaloid, and some contained 2·6 per cent. of alkaloid; but, as a matter of fact, the one which contained 3·3 per cent. yielded extract in about the proportion of 3·3 per cent.; and the one which contained 2·6 per cent. of alkaloid yielded extract in about the proportion of 2·6 per cent.

Mr. DUNSTAN said that that was exactly what he meant. It was a very fortunate thing that it happened to be so in the case of nux vomica, for it had lightened their work. If it had been otherwise other considerations would have had to be taken into account. Mr. Schacht had asked why 15 per cent. had been chosen, and why the strength of commercial specimens should be taken into account. The reason was that in the case of potent drugs, like extract and tincture of nux vomica, it would be extremely dangerous to change their alkaloidal strength. Some medical men would still go on prescribing the same quantities, and serious results would ensue. He believed that some difficulty occurred in the United States through an alteration of the strength of the preparations of opium. He agreed with Mr. Martindale's remarks with reference to the metrical system, but he had reason to believe that they would not see the metrical system introduced in the next Pharmacopœia. For that reason he had described the process in "official phraseology." As to the actual method of preparing the extract, of which Mr. Robbins had spoken, he (Mr. Dunstan) did not think that it was very material what process of extraction was used, and it might be very well left to the manufacturers, but the method that they had proposed seemed to be a desirable one for use on a small scale. He must thank Mr. Giles for the kind way in which he had spoken of their work. It seemed to him extremely important to have pharmaceutical preparations of definite alkaloidal strength, especially in the case of such a drug as nux vomica. He hardly agreed with Mr. Greenish with reference to the powdered nux vomica. Mr. Short and he had examined a great number of commercial specimens, both powdered and unpowdered, and they found that the percentages of alkaloid coincided pretty closely. One might safely say that powdered nux vomica was free from adulteration. Mr. Groves had raised the important point of the discrimination of the alkaloids. There were certain practical difficulties in the way of proposing a separation for general use. A skilled chemist would be required to work so delicate a method, and, although the proportions of brucine and strychnine varied somewhat in different samples, the medicine was given in such small doses that the variation was unimportant. As to the fixed oil, the extract prepared with the diluted spirit would contain less of the oil than the extract prepared with rectified spirit according to the British Pharmacopœia.

The PRESIDENT said that, like Mr. Giles, he hoped that the work which had been done by those two eminent

workers, who had so well proved their qualifications, might be continued in other directions. He was proud to see that not only the work had been done by students of the Society's School, but that it had been done partly with the aid of the excellent research fund of the British Pharmaceutical Conference.

A paper was then read on—

The Estimation of the Alkaloids in the Root of the Atropa Belladonna.

BY WYNDHAM R. DUNSTAN AND F. RANSOM.

The paper is printed on p. 623, and gave rise to the following discussion:—

Mr. Luff said that in the assay of a substance it was extremely important that the workers should ascertain that the alkaloid which they extracted was pure. He did not think that the authors had made good that point. They took a certain amount of pure atropine and boiled it with spirit and chloroform, and extracted the alkaloid, and found the same amount as that with which they started; but they had not shown that it was the same alkaloid. His experience was that they could not boil an alkaloid in spirit without decomposing it. Saponification took place, and the alkaloid decomposed into another base and possibly an acid. An organic analysis was required to prove whether the alkaloid was the same as that with which they started. The percentages of carbon, hydrogen and nitrogen must be determined. Some years ago Mr. Groves left some aconitine in contact with ammonia and it disappeared. Dr. Wright and he (Mr. Luff) showed in later years that the aconitine had been converted into benzoate of ammonia and into another alkaloid, namely, aconine. The aconine might be about the same weight as the aconitine originally operated upon, because it had taken up water, and the water which was accreted might make up for the benzoic acid which was excreted. The aconine had, however, entirely different physiological functions from the aconitine, and was barely poisonous at all. He had taken a tolerably large dose of it. The experiments in the paper were comparative ones, and the old saying that comparisons were odious might be applied to them. During the two years that Dr. Wright and he were working upon alkaloids, he made more than two hundred organic analyses, which had never been mentioned in the papers, simply for the purpose of seeing whether the alkaloid they were working upon was a pure one or not.

Mr. Gerrard said that he was glad to hear the paper read that evening, more especially as he had taken considerable interest in the extraction of the alkaloids and active principles of plants; and he was now engaged in a research upon belladonna which was being aided by a grant from the Pharmaceutical Conference. He took exception to the remarks made by Mr. Luff as to the saponification of atropine when it was brought into contact with alcohol. He believed that there was no change whatever, and that manufacturers employed hot alcohol for the purpose of extracting atropine and hyoscyamine from the belladonna plant. He should have liked to hear from Mr. Dunstan that he had made some comparative experiments with other solvents than mixtures of alcohol and chloroform, for instance, with alcohol alone, for it seemed to be demonstrated in the paper that the more he increased the alcohol in the mixture the greater was the solvent power upon the alkaloidal constituents. The advantage shown in the paper was that by Mr. Dunstan's method there was not so much colouring matter got out as when alcohol alone was the solvent; but, notwithstanding that, he was of opinion that alcohol alone was the best solvent for the extraction of the alkaloids from the belladonna plant. In this opinion he was backed up by experiments which he had made. In the paper it was remarked that other workers assumed their products to be pure, while the authors had proved their own to be so. He should like to ask the authors of the paper what evidence they had upon that point. When the root was extracted with chloroform and alcohol there was a small amount of brown colouring matter, and even when that was shaken again with water there was some colouring matter in the aqueous solution. Therefore he considered that the figures which were given could not be taken to represent absolute atropine. The authors also stated that they used no precipitants, and that was claimed as one advantage of the process. But what was ammonia but a precipitant of an alkaloid. In another part of the paper it was shown that a solution of iodine in iodide of potassium had been used as a precipitant. Within the last year he had examined a considerable number of samples of belladonna root and leaf by a very simple method. He exhausted the belladonna with boiling alcohol, and removed the alcohol by evaporation or distillation. Of course the residue was highly coloured, and contained a good deal more than atropine and hyoscyamine. He diluted with sufficient water to obtain a clear solution. The clear aqueous solution was poured off, and the residue was well washed. A considerable quantity of the colouring matter was thus got rid of, and he then had the salts of atropine in a pale brown solution. To this solution he added ammonia in excess, and shook it with a good volume of chloroform, chloroform being by far the best solvent of free atropine. On the separation of the chloroform, and after evaporation, he obtained his residue of alkaloid containing colouring matter. Whatever was alkaline in that residue must be alkaloid, and the alkaloid must be atropine or hyoscyamine. He prepared a standard solution of sulphuric acid, 100 parts of which should exactly neutralize 1 grain of atropine. He added the dilute sulphuric acid to the residue until he got a slightly acid reaction. Every hundred minims of the dilute acid equalled 1 grain of atropine or hyoscyamine, as the case might be. The results of that process were as scientifically exact as it was possible to be, and he claimed that the process was far more accurate than the process of weighing and re-precipitation and so on, which was given in the paper. He noticed an average loss of about 5 per cent. by the reconversion. He should take it that that 5 per cent. of loss represented something more than alkaloid, and therefore he concluded that the substance was some impurity. He trusted that his criticisms would be well received, as they were given in the best spirit and with the simple object of evolving the truth.

Mr. Tanner asked why the authors chose a mixture of chloroform and alcohol as a solvent for the alkaloids of belladonna root. It seemed to him that chloroform *per se* would not dissolve the alkaloidal salts. He thought that it was pretty well recognized that the state in which the alkaloid existed was one of combination with organic acid. Therefore he was unable to see the object of employing chloroform. That body was a very good solvent for most alkaloids when uncombined, but it was contrary to his experience that it was a solvent of alkaloidal salts. The solvent action in the process appeared to have been produced entirely by the alcohol.

Mr. Dunstan, in reply, referring first to the remarks made by Mr. Luff, said that, of course, the use of iodine and potassium iodide did not absolutely ensure against an alteration of the alkaloid. The alkaloid might have been altered, but, on the other hand, it was extremely improbable in the present case that an alteration had taken place; and before they assumed that such alteration did actually occur some experimental evidence must be adduced. The evidence which was possessed at the present time was against any such assumption. A strong evidence in support of the non-decomposition of the alkaloid was found in the fact that the crystalline form of the residue at the end of the process was the same as the crystalline form of the pure alkaloid taken at first. If the resulting alkaloid was a different one, it would probably have some crystalline form different from the original one. Again, it was very improbable that any alkaloid would be altered, and especially that it would be saponified, without an alteration of weight. Mr. Gerrard

admitted that the use of alcohol alone extracted more colouring matter than a mixture of chloroform and alcohol, and that was one reason why alcohol only had not been used in the process described in the paper. The extraction of the greater quantity of colouring matter involved difficulties later on. Mr. Gerrard's method seemed to be an extremely long one, and involved several processes of purification and repurification, and that appeared to be due to the fact that alcohol alone was employed as an extractive agent.

Mr. GERRARD said that the steps of his process were much shorter than those of Mr. Dunstan's process.

Mr. DUNSTAN said that surely nothing could be simpler than extracting the belladonna root with a mixture of alcohol and chloroform, shaking the mixture with water and then extracting the pure alkaloid with chloroform after the addition of ammonia. He did not deny that Mr. Gerrard's process was one of value, but it seemed to him that the process described in the paper was much shorter, and recommended itself by the fact that less colouring matter was extracted than when alcohol was used alone, and that the pure alkaloids were actually isolated and weighed, not inferred from the titration of an impure residue with an acid. That was really the point at the bottom of the paper. Mr. Gerrard, in further criticizing the process in detail, had said that the aqueous solution, which was obtained after shaking the chloroform-alcohol mixture with water, was coloured, and that the colour was not got rid of on agitating with chloroform. He (Mr. Dunstan) admitted that, but when ammonia was added, and subsequently the chloroform, it was found that the whole of the colouring matter remained in the ammoniacal solution and the chloroform separated practically colourless. Upon the spontaneous evaporation of that solution the alkaloids were got in a crystalline condition. Mr. Gerrard had gone on to criticize the results of the estimation of the pure alkaloids in the residues. As a chemist, Mr. Gerrard must know that it was impossible to get results within a milligramme, and it was obviously unfair to convert the numbers into percentages. The differences were only experimental errors, and the fact that a process of precipitation had been gone through must be taken into consideration. Mr. Tanner had referred to the solubility of alkaloids and alkaloidal salts in chloroform. No general rule could be laid down upon that point. In the case of the nux vomica, the alkaloidal salts could be extracted by chloroform alone, provided sufficient chloroform was used. In the case of belladonna the same result could be obtained, as the alkaloidal salts were also soluble in chloroform. This was referred to in the paper in connection with the first experiments.

The PRESIDENT said that this paper furnished another evidence of good work, and, he might say, of a great deal of work. It contained the result of a very long series of investigations. He could not but feel that a very large amount of experimental proof must have preceded the production of the paper. He had been very much struck by the observation of Mr. Luff with regard to the probable changes and the saponification of the alkaloid by the alcohol. He supposed that it must be admitted that the experiment which Mr. Luff tried upon himself was a fairly strong one. No doubt the point would be noticed by Mr. Dunstan in his further inquiries.

The last paper read was—

A NOTE ON A CASE OF SOPHISTICATION OF AMERICAN OIL OF TURPENTINE.

BY BOVERTON REDWOOD, F.I.C., F.C.S.

This paper is printed on page 665.

Mr. DUNSTAN said that Professor Redwood placed some of the residue in his hands on the previous morning, that he might find out its nature. In a rough experiment which he made he found that on treatment with solvents it yielded a substance which from its physical properties appeared to be pimaric acid. That acid was, he believed, yielded by two species of pines, namely, *Pinus pinaster* and *Pinus maritima*; and he believed that both those trees were found in South Carolina, where turpentine was produced. The quantity of residue which he had to work with was too small to enable him to speak very definitely.

Mr. DUNSTAN also called attention to the Government flashing point apparatus, which was on the table.

Mr. HOLMES, calling attention to various botanical and other specimens exhibited on the table, said that the samples of cinchona bark and the very fine selections of cinchonas had been recently presented by the Government. They came from the Darjeeling plantations, and represented the remainder that were not sent on the former occasion. The Society now possessed a tolerably complete set of the plants which yielded India barks and also of the barks themselves. There were also specimens of the solid and liquid paraffins, which had been recently introduced into the German Pharmacopœia. These were well worthy of attention.

The next meeting was announced for March 5.

Parliamentary and Law Proceedings.

THE SALE OF POISONS.—PROCEEDINGS AGAINST CHEMISTS AND DRUGGISTS.

At the Worcester City Police Court, on Tuesday, Mr. Edward John Kitson, chemist and druggist, Broad Street, was summoned, on adjournment, for selling poison contrary to the provisions of the Pharmacy Act, on December 19. Mr. Quarrell appeared for the defence.

Mr. Power, chief of police, stated that on January 22 last the case came before the Court, and he was then asked by Mr. Quarrell to produce a certain Order in Council which Mr. Quarrell alleged was published in the *Gazette* in 1869. He was now prepared to proceed with the case. There was no desire on the part of the prosecution to proceed against Mr. Kitson, but the only object was the safety of the public.

Richard Eadon, waiter, repeated his evidence as to the purchase of the poison, the subject of the summons. He went to Mr. Kitson's shop on the day named and obtained two pennyworth of chloride of lime and a packet of "rat killer." Witness was not asked to sign a book.

Cross-examined: Witness did not ask for poison but "rat killer." The packet was labelled "poison."

William George, a porter, who, it will be recollected, was tried for attempting to commit suicide by taking poison, deposed that he asked the last witness to fetch some mice poison for him. He did not say what he wanted it for. He admitted having taken the contents of the packet. He afterwards suffered from "pains all down the spine." He did not closely observe the packet. He remembered that it was labelled poison.

Police-Constable James spoke to going to the house of the last witness, finding him very ill, and restoring him by means of an emetic.

Dr. Swete stated that he analysed a small quantity of the rat killer remaining, which was brought to him in a bottle. He found it to contain strychnine.

Cross-examined: There was only a small quantity of strychnine.

Mr. Power produced a copy of the *London Gazette* for December 29, 1869, including preparations of strychnine as "poison" under the Act.

For the defence Mr. Quarrell submitted that the poison alleged to have been improperly sold, being a compound, and not a preparation, was exempt from the Act, and that the day before the alleged offence was committed, the defendant gave strict orders to his assistants not to sell any poison without duly registering it. A register of sales commenced on the previous day and continued ever since contained no register of the sale of rat killer

on December 19, and no rat killer was sold on that day to any person answering to the description of Eaden.

Ernest Turner, one of the defendant's assistants, gave evidence bearing out this defence.

Being permitted to make a statement to the Bench, Mr. Kitson denied that rat poison was sold during his presence either on the 18th, 19th, or on any subsequent day in December, or up to the present time, without registration. He had given strict instructions to his assistants not to sell "rat killer" or any other poison without registering it, and he believed they had honestly carried them out.

Inspector Sommers said that on the morning Mr. Kitson came to the office of the chief of police and demanded the name of their informant in the first prosecution against him. He said he believed it was one of his assistants, and he had discharged that young man. Witness informed him that the police received information by letter. It was not written by any one connected with his establishment.

The Mayor said this prosecution had been instituted on public grounds. There was no desire to deal harshly with Mr. Kitson, as the magistrates had always known him as a respectable citizen.

A fine of 10*s.* 6*d.* and costs, £1 11*s.* 6*d.*, was inflicted.

At the Worcester City Police Court, on Tuesday, William Morris, chemist and druggist, was summoned for that on January 21 last, he unlawfully sold some prussic acid, being a poison named in the first part of Schedule A in the Pharmacy Act, 1868, to Eliza Ross, who was then a person unknown to him, not being introduced by some person known to him.

The Chief of Police (Mr. Power) said this was a somewhat peculiar case, for the purchase of the poison could not be proved, because the person who purchased it poisoned with it herself and her child. For the purpose of proving the case, however, he had given notice to the defendant to produce his register of the sales of poisons. There was no doubt an entry of the sale was made at the time, but he contended that it had not been made in compliance with the Act, the proper safeguards not having been taken.

Inspector Sommers stated that on the evening of the 22nd ult., he went to defendant's shop, and asked him to produce his poison register. Witness found in it an entry of the sale of sixpennyworth of prussic acid on the 21st to "Mrs. Jones, Carden Street." In reply to questions the defendant said he knew the woman well, that she was a charwoman, and had been a frequent customer at his shop.

In answer to the Bench, the defendant denied having described the purchaser as a charwoman.

William Ross, husband of the deceased woman, said his late wife never acted as a charwoman or went by the name of "Mrs. Jones."

Mr. Power deposed that, at the inquest held by the City Coroner on the bodies of the woman and the child, Mr. Morris said, in reply to the Coroner, that he had no doubt the deceased was the same person who made the purchase in question at his shop.

William Ross, being recalled and shown the entry in the defendant's register, denied that it was in the handwriting of his wife.

Mr. Power remarked that the defendant acted illegally in not acquiring sufficient information about the woman to conform with the terms of the Act.

In defence, Mr. Morris explained that he had known the deceased as a frequent customer at his shop for twelve months, and that he had often sold her quantities of laudanum which she had never improperly used, and he therefore contended that he had sufficient knowledge of her within the meaning of the Act.

A fine of £1 1*s.* and 13*s.* costs was imposed.—*Worcester Daily Times.*

Poisoning by Prussic Acid.

On Tuesday, February 5, an inquest was held at Norwich touching the death of Mr. F. W. Skipper, who had been found dead in his bedroom.

Mr. F. Bailey, surgeon, deposed to making a *post-mortem* examination of the body, and to deceased having died from taking prussic acid. Deceased had been in a low state of mind for some time past. The prussic acid produced was of Scheele's strength. Witness saw deceased on Saturday night, and from the appearance of the body when he made the *post-mortem* examination he thought he had been dead about sixteen hours. Witness believed deceased was at his club on Sunday night until ten o'clock.

Mr. Octavius Corder, pharmaceutical chemist, said the bottle he now produced was brought to him by Mr. Morse, who had found it on the washstand in deceased's room. There was now remaining in the bottle about forty drops of acid, which was quite sufficient to kill two adults. It was unusual to sell such a poison to any person, unless to a medical man. There was no seller's name on the bottle, and there was no mark upon it that could afford him any clue as to who sold the poison. The leather tied over the stopper of the bottle was an old piece of binding, and not like the leather placed on the bottle by a chemist. In his opinion the bottle was not sold by a chemist.

The Coroner said they had no need to go into the question as to where the bottle came from, even if he had information about it, but if it was ever found out who sold it, he should think it a proper case for the magistrates to deal with. He should send his notes of the inquiry to the Secretary of the Pharmaceutical Society, in London, whom he had always found ready to assist him.

The Jury returned a verdict "That deceased met his death by taking prussic acid, whilst in an unsound state of mind."

Decision under the Dental Act.

At West Ham, on Wednesday, February 6, the case of "Canton v. Holford" came before Mr. Phillips for judgment, in which Thomas Constantine Holford, a chemist and dentist, practising at 342-4, High Street, Stratford, was summoned by Frederick Canton, the hon. secretary of the British Dental Association, for having on November 14 last used the initials "L.D.S.," being the distinction of a qualification or certificate in relation to dentistry or dental surgery, which he did not possess, contrary to section 4 of the Dental Act, 1878, 41 and 42 Vic., cap. 33. The case is of some importance to the medical profeseion generally, as it is the first action decided under the Dental Act of 1878, which was framed on the lines of the old Medical Act of 1858, the 40th section of which corresponded with the 4th section of the Dental Act, under which these proceedings were taken, the *maximum* penalty imposable being £20. On the 25th of November, 1878, the defendent applied to Mr. William John Clark Miller, the registrar of the General Council of Medical Education and Registration, for registration under Clause A of the 6th section of the Dental Act, he signing himself "L.D.S., Ont.," but registration was refused. On April 15 following defendant applied for registration as having been in practice before July 24, 1878, and was registered under Clause C of the 6th section of the Act. Fraud was not alleged by the prosecution, who admitted that the defendant was a licentiate of dental surgery of the Medical College, Ontario, but they contended that by the use of the simple "L.D.S.," without the affix "Ont.," or "Ontario," Mr. Holford had made himself amenable to the Act. Mr. Phillips gave judgment at great length. Having reviewed the circumstances of the case, he said he had come to the conclusion that the title "L.D.S." simply was one which would only be granted by the medical authorities in this country, and that the defendant therefore had committed an offence within the meaning of the Act in using the designation of a qualification which he did

not possess. He thought the defendant would have been within his right if he had used the letters "L.D.S., Ontario," but having omitted the addition, he had committed an offence. Taking into account, however, that this was the first case under the Act, and having regard to the fact that defendant was an "L.D.S.," though of Ontario, he should not impose the full penalty of £20, but a fine of £2, and the usual costs.—*Times.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Examination of Chemicals.

Sir,—I shall be much obliged if you will allow me space to reply to Mr. Nicholson's remarks upon the above subject.

Liquor Potassæ.—Mr. Nicholson's calculation is quite correct, "20 ounces of pot. bicarb. would require 14·8 ounces of slaked lime to combine with the whole of the carbonic acid," but he seems to have overlooked the fact, that, when solution of potassium bicarbonate is boiled, carbonic acid is evolved. I find that under the circumstances named by me over one-fourth is so driven off. The remainder requires about 11 ounces of calcium hydrate. I used freshly slaked lime prepared from marble; still 12 ounces leaves but a small margin for the possible deterioration of the lime, etc.; the substitution of sixteen for twelve would give a better working formula.

The quantities mentioned did not apply to the cold process. I have lately made some in this way, using equal quantities of slaked lime and potassium bicarbonate. I found, however, that to complete the process, with such occasional agitation as I gave, required six weeks. With frequent systematic shaking much time might be saved.

Should the official formula for liquor potassæ at any time be altered, I hope the strength will be 5·6 per cent. KHO; as pharmacists would then have the usual volumetric solution always at hand, and the alteration could scarcely influence the present dose, etc.

Peroxide of Hydrogen.—Although this compound in strong solutions is very unstable, I am not by any means sure that a 3 per cent. or 10-volume solution is so much so as Mr. Nicholson's remarks would lead us to expect. Perhaps his paper (the publication of which is unfortunately delayed until next month) may contain some evidence on this point.

The test I used was that mentioned by Mr. A. H. Mason (*Pharm. Journ.*, [3], vol. xi., p. 705). He thus describes it: "A given volume is taken, and placed in a tube with excess of potassic bichromate. On agitation over mercury a volume of oxygen is evolved, which, supposing 1 c.c. of H_2O_2 has been taken, expresses its strength in so many volumes. Thus 1 c.c. of a 10-volume solution would yield 10 c.c. of oxygen at 0° C. and 760 mm."

To me this test offers the great advantage of being independent of any unstable reagent. But where a large number of samples have to be examined titration by means of potassium permanganate is undoubtedly more convenient.

I was rather surprised by Mr. Nicholson's statement as to "the volume strengths being properly only half of what" I stated; inasmuch as the bichromate was to all appearance unaltered and was capable of decomposing a further quantity of peroxide. The reaction differs according as the bichromate or the peroxide is in excess, but when 5 c.c. of a 3 per cent. or 10-volume solution of peroxide is mixed with 15 c.c. of volumetric solution of bichromate a brown coloration ensues; this disappears, more or less rapidly, according to the temperature, oxygen being evolved and the bichromate assuming its normal condition.

The following facts will, I think, disprove Mr. Nicholson's statement that "half of the oxygen liberated is due to the bichromate." A solution of bichromate was carefully standardized so that it should completely oxidize an equal volume of an acid solution of ferrous sulphate (the burette and reservoir containing this latter solution were supplied with an atmosphere of hydrogen). To 15 c.c. of the bichromate solution, 5 c.c. of solution of peroxide was added. When the reaction was complete, the solution was gently warmed, to free from dissolved oxygen, and the ferrous solution slowly added; 15 c.c. was required before potassium ferridcyanide indicated any trace of a ferrous salt in a drop of the mixed solutions. To another 15 c.c. of bichromate six separate lots (5 c.c. each) of peroxide were added, allowing sufficient time to elapse before each addition; the bichromate required 14·7 c.c. ferrous solution. As this experiment had been conducted in an open vessel, I thought that perhaps the deficient bichromate had been carried away mechanically during effervescence; the experiment was therefore repeated in a loosely covered flask with 10 c.c. bichromate solution, and five lots (in all 25 c.c.) of peroxide; 9·8 c.c. of ferrous solution was required. Finally, the two solutions were again titrated and found to be unaltered.

Of course where an acid solution of potassium bichromate is employed the reaction is different.

Citrate of Magnesia.—Mr. Nicholson's remark on soda water, that "it is well for the general consumer" it is not what its name would imply, refers equally to this preparation. Should Mr. Nicholson, for a moment forgetful of his chemistry, apply to a pharmacist for citrate of magnesia and be supplied with an article rightly so-called, he would probably find that, however much more worthy it was of its name, it was not so pleasant in use as our old friend "known to the public as citrate of magnesia," or "citrate of magnesia so-called," as it is frequently labelled. As to its further composition Mr. Nicholson's assumption is correct.

Liq. Sodæ Effervescens.—That manufacturers should be asked to make, and pharmacists to keep in stock, four preparations, where they now have one, I do not consider a practical suggestion. Better far to have the plain aerated water and to send out when requested suitable doses of sodium bicarbonate. Mr. Nicholson misreads me as to the quantity of chalk present in town water. I reckoned it in terms of sodium bicarbonate, $NaHCO_3$, and not as sodium carbonate Na_2C,O_3 as he states. By town water I meant London water, and under "liq. potassæ effervescens" so called it. The result arrived at was from my own experiments; observations, extending over many years, show that the variations have been very slight. I think from the large range (0 1 to 1·5 Na_2CO_3) Mr. Nicholson gives, he must refer in some cases to water supplied to provincial towns. As 1·5 grains $NaHCO_3$ equals 0·95 grain Na_2CO_3 the sample referred to by me would be well within Mr. Nicholson's experience.

St. John's Wood. W. H. Symons.

Errata.—In Mr. Dott's article on "The Salts of Narcotine," p. 581, col. ii., line 18 from bottom, *for* "9·740 grs. lost 1·48 grs.=1·48 per cent." *read* "9·740 grs. lost 0·145 gr. =1·48 per cent. In "The Month," p. 604, col. i., line 17, *for* "granulated zinc," *read* "granulated nickel;" col. ii., line 6 from bottom, *for* "reduced," *read* "produced;" p. 605, col. 1., line 15, *for* "vitality," *read* "volatility."

J. T. Liverseege.—(1) See *Pharm. Journ.*, Oct. 28, 1882, p. 346. (2) The chloroform of the tincture is thrown out of solution when mixed with water. (3) Yes. (4) Mix the hyd. amm. with the vaselin and then add the acid.

J. Wood.—We believe the work can be obtained from Messrs. Chatto and Windus, price about 4*s.* 6*d.*

"Arbitrator."—We cannot recommend any particular book for the purpose.

J. C. A.—A paper entitled "Some Experiments on Oil of Lavender," by Mr. Shenstone, will be found in the *Pharm. Journal* for September 9, 1882, p. 207.

W. T. Elliott.—We are unable to explain the reference.

J. Brown.—The inflammation is due to the rapid oxidation of the organic matter.

R. Hawkes.—See a paper on the Cultivation of Medicinal Plants at Market Deeping (*Pharm. Journ.*, [3], xii., 237).

J. C. Harvey.—The passing of the examination in question does not entitle you to carry on the business of a chemist and druggist.

W. Wilkinson.—Eranthis hyemalis (Winter Aconite).

Communications, Letters, etc., have been received from Messrs. Paterson, Smith, Fletcher, Dott, Lawrence, Crowder, Wilkinson, Patman, L. S., H. C., Inquirer, Minor.

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"New York Medical Journal," *August* 1880,
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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AS MANAGER or SENIOR. Registered Dentist. Minor qualification. Married. Permanency desired, but temporary not objected to. K., 7, Capworth St., Leyton Green.

AS ASSISTANT. London or suburbs preferred. Age 25. Height 5ft. 6in. 9 years' experience. H. A., 6, The Terrace, Griffith Town, Pontypool, Mon.

APPRENTICESHIP.—The parents of a well educated youth, 17 years of age (who is now studying for the Preliminary), desire to enter into negotiations with a well known Chemist who could offer facilities for acquiring a thorough knowledge of the business. Address, ROBERTS & Co., Pharm. Chemists, Millom, Cumberland.

WHOLESALE.—Either Wet or Dry Counter, or as Under WAREHOUSEMAN. 9 years' experience Wholesale, 5 Retail. Liverpool and London Houses. CHEMICUS, 41, Oxford Rd., New North Rd., N.

AS JUNIOR. London or large town. In or out-door. Age 20. Height 5ft. 7in. Abstainer. 5¼ years' experience in high class country business. Excellent references. JOHN ELLERINGTON, St. Cuthbert's Ter., Hexham.

AS JUNIOR. 5½ years' experience. Age 21. Height 5ft. 10in. London or large town preferred. A. CLARKE, 3, Cambridge St., Bridlington.

PART employment by a Student. Well up in shop work, accurate and quick Dispenser. Little or no salary if board and lodging found. GUSFORD NURSERY Co., 68, Bold St., Liverpool.

IMMEDIATELY.—Out-door. From 9 a.m. to 6 p.m. For putting up stock, or to assist at Retail counter. Good references. Varied experience. Disengaged. B., 9, Nunhead Grove, Peckham, S.E.

AS ASSISTANT. In or out-door. Age 24. Height 5ft. 9in. G. H. C., 61, Lee St., The Coppice, Oldham.

AS JUNIOR, with time for study. Laboratory preferred. Age 20. 4½ years' experience in light country Retail and Dispensing. References. Photo. D. McG., A. Veitch, Castle Douglas.

AS MANAGER, permanent or temporary. 13 years' varied experience. Ætat. 30. Undeniable references. CHEMICUS, 2, Bairstow St., Preston, Lancs.

MANAGER of Branch, Senior ASSISTANT, or any position of trust (out-door). Accustomed to Wholesale, Retail, Dispensing, Prescribing, Dentistry, &c. Married. Permanency. Registered. L. S. D., Messrs. Lofthouse & Saltmer, Hull.

LOCUM TENENS or Temporary ASSISTANT. Qualified. By the day, week or month. Town or country. CHEMICUS, 51, Judd St., St. Pancras, W.C.

AS ASSISTANT, in London or suburbs, with time in morning to attend college. Salary no object. Age 24. Passed Minor. Understands Dentistry. J. T. H., 23, Alma Sq., N.W.

ENGAGEMENTS WANTED.

AS JUNIOR in light Retail and Dispensing. 6 years' experience. Height 5ft. 5½in. South preferred. J. T. R., 80, Newbridge St., Newcastle-on-Tyne.

EVENING employment with a Chemist, or to Dispense for Medical Man, by a Student reading for Minor. Age 27. First-class testimonials. J. W. B., 31, Regent Sq., W.C.

AS Junior ASSISTANT (shortly), in a good business in London, where two or more are kept. Age 20½. Height 5ft. 8½in. Good Dispensing experience. ABSTAINER, 2, Ashley Villas, Shaftesbury Rd., Southsea.

LOCUM TENENS or Temporary ASSISTANT. Experience and references good. Disengaged. Terms moderate. CHEMICUS, 53, Rye Lane, Peckham, S.E.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. Over 30 years' experience, and 12 years references; with a list of more than 50 former clients forwarded on application.

AS ASSISTANT, in good Dispensing and Retail. Nearly 8 years' experience. Neat and accurate Dispenser. Good references. STATIM, 4, Stanley St., Haxby Rd., York.

AS JUNIOR, in good Retail and Dispensing business. Country preferred. Age 19. Over 3 years' experience. W. DARBY, Market Pl., Dorrington, Spalding.

ASSISTANTS WANTED.

T. PARKER, Chemist, York, requires a permanent SENIOR, not under 24 years old. A good all-round man for a middle-class Retail business. A first-rate character and good business ability indispensable.

A GENTLEMANLY ASSISTANT (one only employed) for a good class suburban Dispensing business. He must have passed Minor examination and had experience in a good house. Personal application or full particulars, with carte, to H. C. BIRCH, Upper Norwood, S.E.

IN a London suburb.—An ASSISTANT, about 22, accustomed to Dispensing, light Retail and Prescribing. Must be willing to assist occasionally in postal duties. Personal application or full particulars, stating salary required, to M. J., 119, Railton Rd., Herne Hill, S.E.

QUALIFIED ASSISTANT, to Manage Drug Department of mixed Retail. Out-door, and no Sunday duty. State age, height, salary required, and enclose photo., to MANAGER, care of Messrs. G. B. Kent & Sons, Great Marlboro' St., London, W.

MESSRS. PROVOST & CROOK, 94, Terminus Rd., Eastbourne, have a vacancy for a Senior ASSISTANT. Age not under 24. Abstainer. Good references indispensable. Hours 8 till 8. Send full particulars and (if possible) enclose carte.

IMMEDIATELY.—A competent JUNIOR. About 25. Must be able to Dispense, Prescribe, and Extract Teeth. Apply, with full particulars, to J. WILLIAMS, Chemist, Usk.

A COMPETENT in-door ASSISTANT, for good country business. Well experienced and recommended. Hours 8 till 8. Sunday duty nominal. Apply, with particulars, to Mr. CLARIDGE, Chemist, Warwick.

JUNIOR ASSISTANT, at once, in a light Retail and Dispensing business. In-doors. Good personal character and references. Apply, with carte if possible, stating age, height, experience, reference, and salary required, to ALFRED COLEMAN, 65, St. Mary St., Cardiff.

RANDALL & SON, Southampton, seek immediately a Junior ASSISTANT, well grounded in Dispensing and general business. Good personal character. In house. State salary required, age, height, previous experience, &c.

ASSISTANTS WANTED.

TRUSTWORTHY ASSISTANT, competent to take charge during absence of principal, willing to make himself generally useful, in a Mixed country business, in Worcester. State age, height, qualifications, salary, references, &c., to JOHN TWINBERROW, Great Witley, near Stourport.

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PARIS.—A first-class English ASSISTANT. Must be a good salesman and able to speak French. Apply to H. ROGERS, 1, Rue du Havre, Paris.

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A GENTLEMAN, to go out to Ceylon, who thoroughly understands the Dispensing of Medicines, &c., and would make himself otherwise useful. Passage would be paid out. Terms and particulars may be obtained by personal application to Messrs. KNOWLES & PHILLIPS, Druggists, 47, Minories, E.C.

JUNIOR or IMPROVER, for shop newly opened. Time for reading. Apply, stating salary, to Dr. ANDERSON, Upton Park, E. Photo. will be returned.

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A JUNIOR ASSISTANT, of gentlemanly appearance and address, accustomed to light Retail and Dispensing. Apply, stating age, height, &c., enclosing carte de visite, to D. ANTHONY, Chemist, Cardiff.

FOR a good-class business. ASSISTANT, about 22. Address, with usual particulars, or personally, to W. A. SUGDEN, 10, Bedford Ter., Kensington, W.

AN out-door ASSISTANT, of gentlemanly and steady habits, not under 23, for a light business. Must be competent and active. Apply, enclosing carte (to be returned), E. PRESLEY, 12, St. Augustine's Parade, Bristol.

E. J. OWLES, Pharmaceutical Chemist, 97, Fore St., Ipswich, has need of an IMPROVER, or JUNIOR, immediately. Also vacancy for a well educated youth as APPRENTICE. Apply in each case as above.

A GOOD Dispensing ASSISTANT, not under 24 years of age, accustomed to first-class trade. Must write a good hand. Apply to GIBBS & GURNELL, Ryde, Isle of Wight. All letters not answered in 3 days may be considered as declined.

AN IMPROVER or TURNOVER APPRENTICE, in a light Retail and Dispensing business. Apply, stating age, height, salary and references, to A. GRESSWELL, Pharmaceutical Chemist (by Exam.), The Mile End Pharmacy, Portsmouth.

MESSRS. PAYNE & ADAMS, Shrewsbury, require, at once, an ASSISTANT, not under 24, for the Retail counter.

IN-DOOR ASSISTANT, qualified for Retail or Dispensing, where several others are kept. First-class references required. Say when disengaged, age, salary, &c. Enclose carte, to be returned. Hours of business 8 a.m. to 7.30 p.m. PHILADEPHUS JEYES, Northampton.

ASSISTANTS WANTED.

AN ASSISTANT, in-door, of good address, not under 21 years. Apply, giving usual particulars, to Mr. J. WHITRIDGE, Oswestry.

A JUNIOR ASSISTANT or TURNOVER. Give full particulars when applying to BARNES & SON, Pharmaceutical Chemists, Preston, who also have a vacancy for an in-door APPRENTICE.

A WELL qualified ASSISTANT, accustomed to good business, to Manage a Branch. Apply, W. BATES & Co., Chemists, Southampton.

A JUNIOR (not under 25), to take charge of Surgeon's Retail. Time allowed for reading. Apply personally, before 12 or after 6, at 86, King's Cross Rd., W.C.

A JUNIOR (as Second ASSISTANT), not under 21 years of age. Apply or address to ALFRED S. AMOORE, 173, Sloane St., S.W.

QUALIFIED and competent MANAGER. Immediately. Age 26 to 30. Hours 9 to 8. Apply, enclosing carte, references, and usual particulars, to L. S., care of Hearon, Squire & Co., 5, Coleman St.

QUALIFIED ASSISTANT. In-doors. Accustomed to a good class country trade. Apply, enclosing photo, to CARLTON & SONS, Horncastle.

JUNIOR ASSISTANT, for light Retail and Dispensing. In-door. One able to Extract Teeth preferred. State full particulars as to age, height, salary, &c. Applications not replied to within four days may be considered declined. R. S. BATHE, Lower Ter., Notting Hill.

AN ASSISTANT, about 22 or 23, who has been accustomed to a medium-class Dispensing, Prescribing and Retail business. Salary £30. Address, with full particulars and references, to Mr. GEO. NELMES, 113, St. Anne St., Liverpool.

AT once, for China, qualified ASSISTANT, who must have a knowledge of accounts and first-class experience. Liberal terms. Apply, giving full particulars of qualifications and previous engagements, &c., to DAKIN BROTHERS, 2 & 3, Creechurch Lane. Leadenhall St., E.C.

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IMMEDIATELY.—Good JUNIOR or IMPROVER, to assist in a small Retail and open Surgery. One desirous of working his way into the medical profession preferred. Apply, stating age, experience, &c., to Dr. HINDHAUGH, 9, Barnsbury Rd., London, N.

ON or about February 26th.—DISPENSER, qualified and seeking a permanency, to take entire charge of Dispensing. Must be accurate and quick. Salary, out-door, £100 per annum. Apply, with qualifications, testimonials, and carte de visite, Dispensing Department, WAND'S Drug Store, Haymarket, Leicester.

ASSISTANTS WANTED.

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A JUNIOR ASSISTANT. One who has had good experience in Dispensing. Apply to M. TAYLOR, English & Foreign Chemist & Dentist, 105, Regent's Park Rd., N.W.

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MUST be sold.—Genuine Prescribing and small RETAIL, with a little Dispensing, in North London. Returns exceed £300. Still increasing. Rent £55. Proprietor going abroad. Fine opportunity for energetic Prescriber and Dentist. Price, including £50 worth household furniture, £250. Apply to Mr. WILSON, 60, Ludgate Hill, E.C.

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Terms for valuation on application.

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32, Ludgate Hill, E.C.

Mr. EDMUND RUTTER

Arbitrator, Valuator & Chemists' Agent,

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Member of the Pharmaceutical Society, and upwards of 30 years' experience in every branch of the business.

Advice given at a small cost to gentlemen about embarking in or purchasing a business.

INTERNATIONAL PHARMACEUTICAL EXHIBITION

VIENNA, 1883.

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Pharmaceutical Society of Great Britain.

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The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, March 5th.

The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on March 5th should be forwarded to the Secretary not later than Wednesday, the 27th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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EVENING MEETING.

The next Meeting will be held on Wednesday, February 20th, at half-past eight o'clock.

Mr. JOHN NESBIT, President of the Branch, in the chair.

The following communications will be made :—

"The Composition of Potassæ Sulphas cum Sulphure."

By THOMAS MABEN and M. DEEHAN.

"The Morphology and Physiology of the Cell."

By PATRICK GEDDES, F.R.S.E., Demonstrator of Botany, Edinburgh University.

Special Notice to Advertisers.—See page xi.

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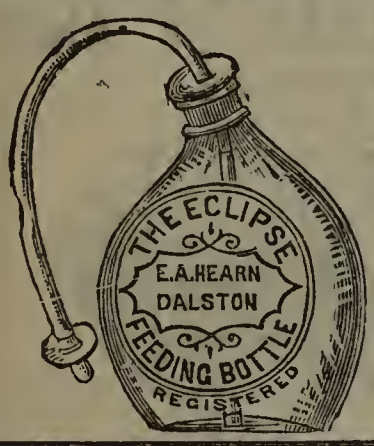

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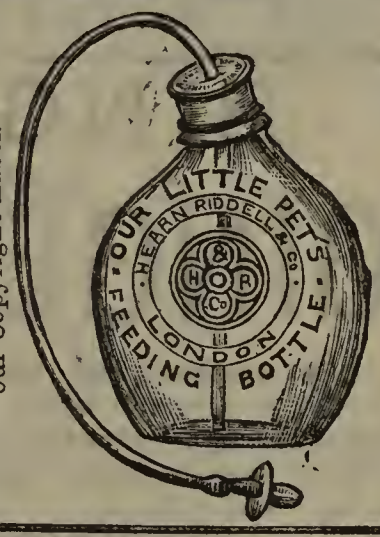

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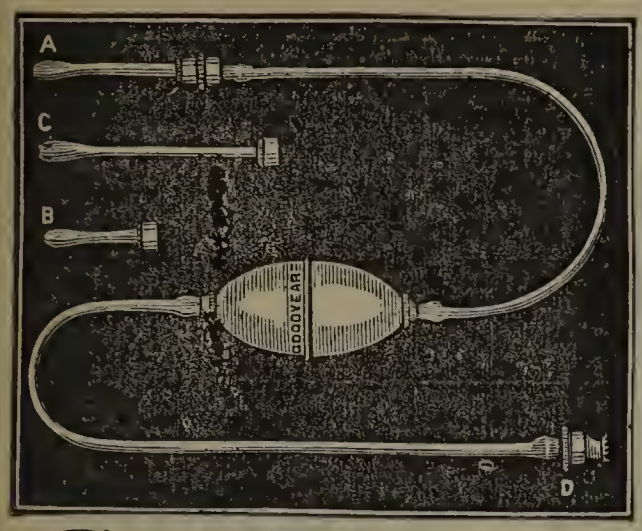

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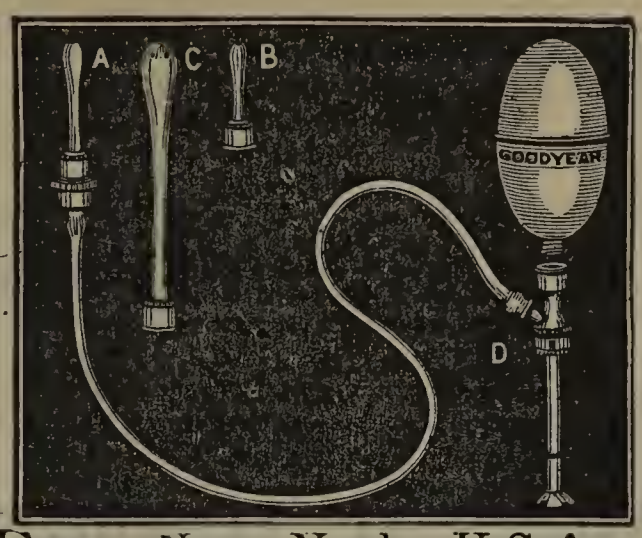

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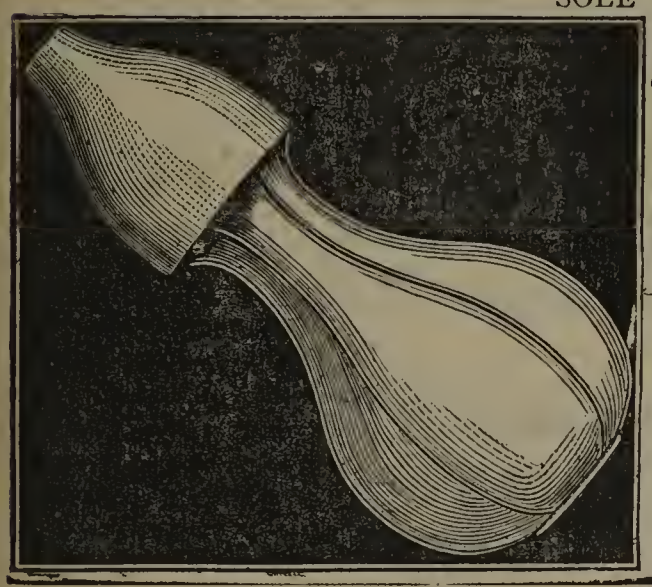

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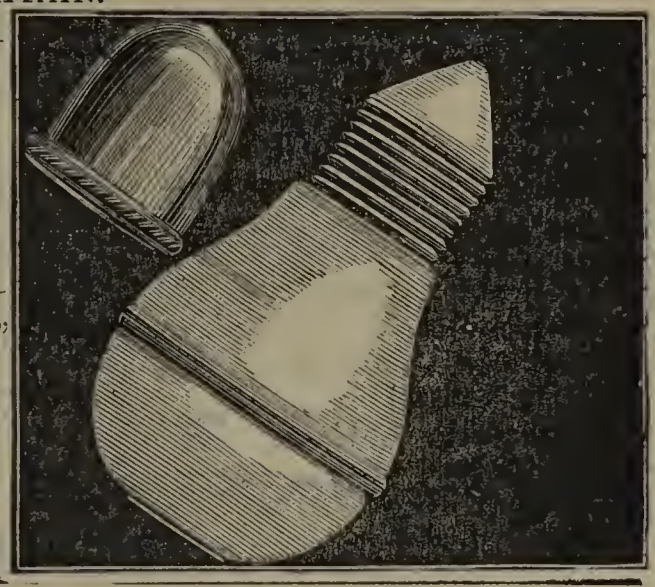

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SIR,

IN order to keep before the Medical and Pharmaceutical Professions the latest authentic researches with regard to Natural Mineral Waters, I beg to call your attention to the following references which have appeared since the issue of the pamphlet on "Æsculap."

In Dr. Sydney Ringer's "HANDBOOK OF THERAPEUTICS," 10th edition 1883, p. 220, is the following :—

"An excellent way to administer some of these Salts (Sulphate of Soda and "Magnesia) is in the form of . . . . . .

"PERHAPS, BEST OF ALL, ÆSCULAP WATER,

"in doses varying from a wine-glassful to half a tumblerful or more."

In "THE MINERAL WATERS OF EUROPE," 1883, by Professor Tichborne and Dr. Prosser James, ÆSCULAP BITTER WATER is placed at the head of Class I. of Strong Purgatives (p. 214), as it is—

"The chief of the 'Ofen' Group . . . . . .
"A mixed purgative, with well-marked antacid reactions . . . . . .
"three times as rich in antacids . . . . . .
"contains nearly three times as much Chloride of Sodium . . . . . .
"not so unpleasant to take . . . . . .
"and is free from organic impurity." . . . . . .

Great weight is attached to the modifying effects of the Antacids and Chloride of Sodium, as—

"These two Salts are admirably suited to reinforce the Sulphates, and the "Mineral Waters thus constituted are remarkable for their efficacy as well "as for their mildness."

I shall be glad to forward you a supply of circulars, descriptive pamphlets, and copies of testimonials, show-cards, &c., free of charge, on application.

I remain, Sir, yours obediently,

E. SAMSON, *Manager.*

NARCOTINE AND ITS DERIVATIVES.*

BY D. B. DOTT.

Narcotine was discovered in 1803 or 1804, by Derosne, but it was supposed to be a salt until its basic nature was demonstrated by Robiquet, in 1807. Narcotine exists in abundance in all kinds of opium; indeed, it is the only alkaloid besides morphia which opium yields in large quantity. Unlike morphia, however, it is a feeble base, not decomposing solution of chloride of ammonium when warmed therewith. Narcotine is interesting on account of the variety of compounds which have been prepared from it, and because of the light which has been thereby thrown on its constitution. The true composition of narcotine was not known until Matthiessen and Foster, as the result of numerous analyses, gave the formula $C_{22}H_{23}NO_7$, which has since been confirmed by Hesse. There is no proof that narcotine possesses a phenolic function, in respect of combining with alkalies like many other alkaloids, unless its ready solubility in alcoholic potash be evidence to that effect.

There is some difficulty in systematically arranging the different decompositions of narcotine, but probably the homologous series—

Trimethyl-nornarcotine	$C_{22}H_{23}NO_7$
Dimethyl-nornarcotine	$C_{21}H_{21}NO_7$
Methyl-nornarcotine	$C_{20}H_{19}NO_7$
Nornarcotine	$C_{19}H_{17}NO_7$

is most naturally first considered. The first member is ordinary narcotine. The second and third are formed by the action of hydrochloric acid, which eliminates first one and then another methyl radical as chloride, while the nornarcotine is only produced by the action of fuming hydriodic acid. The reaction cannot be carried further.

It is by oxidation that most of the derivatives of narcotine are formed. The oxidation is best effected by the action of manganese dioxide and sulphuric acid.

$$\underset{\text{Narcotine.}}{C_{22}H_{23}NO_7} + O = \underset{\text{Opianic acid.}}{C_{10}H_{10}O_5} + \underset{\text{Cotarnine.}}{C_{12}H_{13}NO_3}.$$

Matthiessen and Foster found that narcotine heated above 200° C. *per se*, or for a longer time in contact with water, splits up into meconin and cotarnine; and gave the equation—

$$\underset{\text{Narcotine.}}{C_{22}H_{23}NO_7} = \underset{\text{Meconin.}}{C_{10}H_{10}O_4} + \underset{\text{Cotarnine.}}{C_{12}H_{13}NO_3}.$$

Hesse, however, found that by the action of baryta water on narcotine hydrocotarnine is formed:—

$$C_{22}H_{23}NO_7 + H_2O = \underset{\text{Hydrocotarnine.}}{C_{12}H_{15}NO_3} + \underset{\text{Opianic acid.}}{C_{10}H_{10}O_5}.$$

He therefore inferred that narcotine is decomposed by water in the same way, and not according to Matthiesson and Foster's equation. As hydrocotarnine has since been found among the products of the action of water upon narcotine, it has been admitted that Hesse's reaction is probably correct.

$$C_{22}H_{23}NO_7 + H_2O = C_{10}H_{10}O_5 + C_{12}H_{15}NO_3, \text{ and}$$
$$C_{10}H_{10}O_5 + C_{12}H_{15}NO_3 = C_{10}H_{10}O_4 + C_{12}H_{13}NO_3 + H_2O.$$

Hydrocotarnine ($C_{12}H_{15}NO_3$) was obtained from opium liquors by Hesse, who has so greatly enriched our knowledge of the educts of opium. It is found in very small amount, but may easily be prepared artificially by the action of nascent hydrogen on cotarnine. Hydrocotarnine is a monacid base, melting at 55° C. By ferric chloride and other oxidizers it is converted into cotarnine.

Cotarnine, when crystallized from benzene, has the composition $C_{12}H_{13}NO_3.H_2O$, the molecule of water not being separable without simultaneous decomposition of the base. The platinochloride may, however, be obtained anhydrous, by exposure for a sufficient time over sulphuric acid. By the action of dilute nitric acid cotarnine is converted into cotarnic acid:—

$$\underset{\text{Cotarnine.}}{C_{12}H_{13}NO_3} + HNO_3 + H_2O = \underset{\text{Cotarnic acid.}}{C_{11}H_{12}O_5} + \underset{\text{Methylamine nitrate.}}{N(NCH_6)O_3}.$$

Among the products of the oxidation of cotarnine is *apophyllic acid* ($C_8H_7NO_4$), discovered by Wöhler. It is a monobasic acid, with m.p. 205° C., but has been little investigated.

Both cotarnine and hydrocotarnine yield substitution products with bromine. When bromocotarnine hydrobromide is heated above 200° it melts, gives off hydrogen bromide and methyl bromide, forming the base tarconine, $C_{11}H_9NO_3$. Jörgenson, however, had previously described a base, homologous with that of Wright, which he called "tarconine." By treating an alcoholic solution of narcotine hydrochloride with iodine, Jörgenson obtained what he calls narcotine tri-iodide, $C_{22}H_{23}NO_7.HI_3$. When boiled with alcohol the compound is said to undergo a "remarkable alteration," the tri-iodide of a new base being formed, *i.e.*, "tarconine," which has the composition of cotarnine less two atoms of hydrogen. The following equation is Jörgensen's:—

$$3(C_{22}H_{23}NO_7.HI_3) + H_2O = C_{12}H_{11}NO_3.HI_3 + C_{10}H_{10}O_5 + 4HI + 2(C_{22}H_{23}NO_7,HI).$$

Dr. Wright informs me that he was not acquainted with Jörgensen's paper when his own was written in 1877; otherwise he would not have adopted the name "tarconine." We are of opinion that Jörgensen's conclusions require confirmation. If correct, his base will, probably, require to be renamed "methyl-tarconine."

E. v. Gerichten has recently confirmed the accuracy of Wright's formula for tarconine, and has obtained several new bases from the bromo compound of that alkaloid. The principal bases are—*Nartine* ($C_{20}H_{16}N_2O_6$), formed by heating bromotarconine in a sealed tube with hydrochloric acid; *capronine* ($C_{21}H_{18}N_2O_6$) and *tarnine* ($C_{10}H_9NO_3$) are produced when bromotarconine is heated with water to 150°–160° C. Both nartine and tarnine yield pyridine by appropriate treatment. We know nothing of the constitution of cotarnine, except that it contains this pyridine nucleus and a methyl residue.

Opianic acid ($C_{10}H_{10}O_5$) is, undoubtedly, the most important of the narcotine derivatives. It is obtained in delicate white crystals. It forms salts, having the general formula $C_{10}H_9M'O_5$, the acid being monobasic. The action of hydrochloric and hydriodic acids is similar to that on narcotine, methylnoropianic acid and noropianic acid being produced. When opianic acid is heated with excess of strong solution of potash, meconin and hemipinic acid result.

$$\underset{\text{Opianic acid.}}{2C_{10}H_{10}O_5} = \underset{\text{Meconin.}}{C_{10}H_{10}O_4} + \underset{\text{Hemipinic acid.}}{C_{10}H_{10}O_6}.$$

* Abstract of a paper read before the Edinburgh University Chemical Society, January 9, 1884.

Under the influence of nascent hydrogen, opianic acid is reduced to meconin—

$$C_{10}H_{10}O_5 + H_2 = H_2O + C_{10}H_{10}O_4.$$

When heated with bichromate and dilute sulphuric acid, it is oxidized to hemipinic acid—

$$2C_{10}H_{10}O_5 + O_2 = 2C_{10}H_{10}O_6.$$

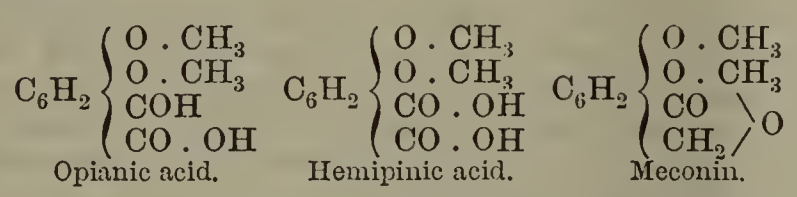
By the action of soda-lime on sodium opianate, *methylvanillin* is formed, which, when boiled with hydrochloric acid, yields vanillin, identical with that obtained from the pods of *Vanilla planifolia*. These important reactions are indicated by the following equations:—

$$C_{10}H_{10}O_5 = CO_2 + C_9H_{10}O_3, \text{ and}$$
$$C_9H_{10}O_3 + HCl = CH_3Cl + C_8H_8O_3.$$

Meconin ($C_{10}H_{10}O_4$) appears to exist in opium, and is formed from opianic acid as above described. It crystallizes in brilliant prisms melting at 110° C. By treatment with hydriodic acid, one methyl radical is removed, but nor-meconin has not been prepared, which would require the replacement of two methyls. By fusion with potash protocatechuic acid is obtained.

Hemipinic acid ($C_{10}H_{10}O_6$) was discovered by Wöhler, in 1844. It crystallizes in rhombic prisms, melting at 180° C. It is a dibasic acid forming salts of the formula $C_{10}H_8M_2O_6$. When heated with potassium hydroxide and water to 220°, it is converted into protocatechuic acid, $C_6H_3(OH)_2COOH + H_2O$. Hence, hemipinic acid may be regarded as carboxylated dimethyl-protocatechuic acid.

These are the principal derivatives of narcotine, but there are many more of less importance which we have not mentioned. Their relation to one another is better seen from the following formulæ:—



Opianic acid. Hemipinic acid. Meconin.

Protocatechuic acid. Vanillin. Methyl-vanillin.

It will be observed that methyl-vanillin is dimethyl-protocatechuic aldehyde. The fact that this compound is obtained from opianic acid, and protocatechuic acid from hemipinic acid, shows that the carboxyl group removed in each case occupies the same position in the benzene chain. Now Barth has shown that protocatechuic acid is 1 . 3 . 4 dihydroxybenzoic acid, whence we know the positions of the aldehyd and methoxyl groups of opianic acid; but it is not evident which position the carboxyl group occupies. Wegscheider has undertaken the solution of this problem, and is presumably still engaged on his researches. Until the question of the constitution of opianic acid is completely answered, as likewise that of the constitution of cotarnine, it will be impossible to fix the true formula of narcotine. Although much information has been gained by recent researches, we are not yet in possession of that knowledge without which a synthesis of the alkaloid is hopeless.

ABRAHAM MUNTING,*

Dutch Medico-Botanist,

DE VERA ANTIQUORUM HERBA BRITANNICA.

BY JOSEPH INCE.

This strange old Latin book, illustrated with many fine botanical engravings, is rare; and the excellence of the plates has caused the work to be much sought after by artists.

It will compete in wordiness of style, and tendency to digression with any similar production of a mediæval writer; but yet it contains no more than a pardonable allowance of self-congratulation.

The author is convinced that he has hit upon a discovery of importance; and he never fails to thank God as the revealer of secrets that it was permitted to him personally to solve the mystery which for so long had obscured the virtues of a marvellous plant, and hid them from the knowledge of mankind.

The copy which, through the kindness of Mr. W. Dunstan, I have had the pleasure of reading is adorned with the usual allegorical frontispiece dear to the collector of such art curiosities, and frequently abstracted; as well as by a fine portrait of Henricus Casimir, of Nassau, to whom, and to many other illustrious persons, the treatise is dedicated.

The author defends his dedication and reasons that it is by no means inappropriate; for not only have the great busied themselves about plants, but have honoured certain herbs and preparations by the bestowal of their family cognomen. Gentian was was so called after its discoverer, Gentius, king of Illyria; Mithridates, king of Pontus, christened the Mithridate; whilst other royal personages followed his example.

Women even, Cicero instances as having been concerned in botanical nomenclature; for did not Artemisia, wife of Mausolus, king of Caria, bequeath her own name to a well-known medicinal plant.

The Roman emperors were not unmindful of the study of herbs, or slow to recognize their remedial efficacy. Our Lord himself, while rejecting the title of Emperor or chief, was not unwilling to accept that of the Healer; and sent Luke, the beloved physician, to preach the gospel in Antioch. It cannot, therefore, be deemed idle compliment to inscribe a book, containing the history of a plant, to princes and potentates.

Having thus cleared himself from the charge of flattery, Munting proceeds to address the reader in curiously phrased Latin and to cite his authorities. Laudatory verses are printed *in extenso*; and then he settles down to his task, and to the composition of his first chapter. "In which is treated of the wonderful power of God, of his ineffable goodness and clemency; of the excellence and weakness of man; of the name of Britannica, its signification, honour and justness; also of the vain boast of some claiming to have made its discovery."

Much learning is expended in quoting ancient

* De Vera Antiquorum Herba Britannica ejusdem efficacia contra Stomacaccen, seu Scelotyrben Frisiis et Batavis de Scheurbuyck Dissertatio Historico-Medica auctore

Abrahamo Muntingio
Groninga-Frisio

Medicinæ Doctore, atque in Patria Groningæ et Omlandiæ Academia Botanices Professore, Amstelodami, apud Hieronymum Sweerts. 1681.

Aloidarium. Historia. 1680.

authorities as to the exact plant to which the term Britannica may be ascribed; but at length, Galen and Dioscorides are cited, who declare that while the Britannica has astringent leaves, good for wounds and much resembling those of *Lapathum agreste*; yet this plant has distinctive characters and the leaves are darker and more dense. It might without rashness, be taken for a species of Lapathum; and might be supposed not to have Frisia (Friesland) as its sole habitat, but to be common in other places.

The author immediately attempts to clear up the doubt by an elaborate description of the whole family of Lapathi, and tell us what Pliny said about it. When the statements of Hippocrates, Dioscorides, Galen and others have been examined, it remains that *Herba Britannica* is a plant which differs from the long list of those enumerated. Various authorities are then adduced in proof of the discrepancy of opinion which exists upon the determination of the true plant. Paulus Ægineta states that it resembles both in shape and general appearance the *Rumex sylvestris*. Oribasius, that it has leaves like *Lapathum sylvestre*, but darker and more hairy. The stem is not large; the root is black; and that the plant has an astringent taste. A crowd of other testimony is brought forward, the names of the writers being now almost forgotten, to support the same view. Petrus Andreas Matthiolus, a great authority, declares that Britannica is neither Bistort nor Tormentilla. Moreover, it is not Cochearia. The knowledge of the plant was lost in the time of the Goths, but was again discovered in that of the Gauls. Its virtues are alexipharmic and antiscorbutic. Numerous formulæ for its medical exhibition are introduced, amongst which are a decoctum, simple and compound; a syrup, gargle, dentifrice, electuary, extract, plaster, ointment, and many other recipes based on the polypharmacy of the period.

Seeing then that *Britannica vera* may be confused with certain other plants, Munting proceeds to give botanical details concerning all those for which it may be mistaken, and concludes his treatise with a description of the method of preserving, training and propagating the whole series. Very beautiful illustrations accompany the text and add much to the artistic value of the book, though strict criticism would hardly defend so elaborate a digression.

Thus we have plates of *Rhabarbarum rotundifolium verum* et *Fimbriatum*, *Lapathum Chinense longifolium*, *L. sativum antiquorum*, *Britannica Americana*, *Lapathum hortense*, *L. vulgare*, *L. unctuosum*, *L. acutum*, *L. longifolium crispum*, *L. sanguineum*, *L. planum paludosum*, *L. vulgare minus*, etc. *Oxylapathum tuberosum Americanum*, *Acetosa vulgaris*, *Acetosa Hispanica maxima*, and others; engravings of which will interest the botanist and the designer.

The treatise on aloes is also profusely illustrated. Many others, writes Munting, have attempted to describe the plant which forms the subject of the treatise, but all without success, and he first was permitted to reveal its true nature for the benefit of others.

Its discovery is thus narrated. There is a Herb called by some *Barba sylvana*; by others. *Plantago aquatica*. A certain noble maiden informed him of marvellous cures effected by this plant. The symptoms of the maladies so treated and relieved seemed to point but to the use of one plant, which he knew by reputation but which he had never seen at home, namely, the *Britannica*. His hope was disappointed, for when one day in the month of June he had diligently examined the plant said to have been employed, he found that it differed in many respects from the object of his search, and was probably that mentioned. In the year of grace (*Salutis anno*) 1672, July the ninth, there was a rumour, not a false one, that the enemy was nearing his native town (Groningen) and he was quietly engaged in punting about the marshes seeking herbs. He observed one of a dark black colour; not unlike Lapathum in appearance, often indeed seen by him before, but not in its native place, with the seed and some remaining flowerets. Immediately he ordered his boat to be stopped at the margin of a ditch, and the plant as being quite new, to be most carefully taken up by the roots. Then he perceived that the root was very black, a point which he examined with great care. When well washed it retained nearly all its colour, and his fingers were stained with a certain blackness. It possessed a wonderful astringency, and hence he no longer doubted that he had discovered the "true and legitimate Britannica of the Ancient Frisians." When, however, a very short time after, he beheld the enemy coming nearer, and that the advanced cavalry were taking him as it were in the flank; in order that he should not fall into their hands, he hastened home, all the same taking with him various plants and adorning his hat with their leaves as a symbol of imminent victory.

"Thus as if splendid with trophies I entered safely into the city." The field in which the plant was found was partly waste, and partly cultivated. It was marshy, and the soil was black. The adjacent village was called Wester-Broek (p. 80).

Next follows a lengthy, and many winding discourse about the character of the earth, and the names applied to it by Latin authors. None but an antiquarian enthusiast would be content to extract the small residue of fact which lies buried under the author's interminable sentences; the reader will be pleased to find that the word *cespes* may rightly be considered to mean turf or bog-land (p. 110).

"In this soil therefore I beheld growing in the water, on a first view as it were common, and not certainly *Rumex sylvestris*; very like *Oxylapathum*, a plant such as I had never seen in all my peregrinations." This is Munting's summary of the description of the ancients.

Britannica is a herb which has roots, stems, leaves, flowers and all seeds, very like *Lapathum agreste*, except that the roots are black; the leaves more oblong; and the leaves more black: stem, not much larger; all the rest similar (*consona*) as I have said.

The whole plant in all its parts has not an ordinary astringent power, but a remarkable one, and with a certain wonderful and strong power of penetration; for astringent remedies put forth (exhibit) this power almost on the superficies, and by their very astringency hinder penetration, and block up ingress. These points are further elucidated and much enlarged; the etymology of the word is discussed, but it is allowed to be immaterial whether the plant be called Britannica, Brittannica or Britanhica. Not till nearly two hundred pages have been exhausted do we come to the author's opinion that the plant about which he wrote so much was

Britannica Antiquorum vera
sive
Lapathum longifolium nigrum palustre.

It is stated to be infallible in scurvy, maladies of the stomach, wounds and serpents' bites. It obviously was of use as a peg on which to hang much learned disquisition.

The reader would perhaps like to see a specimen of the author's style:—

"Hisce tamen auspiciis faventibus, diversis in locis tam palustribus quàm Frisii maritimis omne Plantarum genus sedulò perscrutari aggressus sum, nullumque planè inexcussum omisi, nullis quoque sumptibus, vel laboribus gravatus fui, verum omne studium, omnemque operam adhibui, ut hanc Britannicam Herbam in Lucem rursus revocarem. Quod si idem et alii quoque facerent, non suæ tantum, verum et aliorum mortalium vitæ consulerent, deque posteris præclarè mererentur, atque hinc præterea famam assequerentur æternam.

"Si quidem ejusmodi beneficium posteri cum laude auctoribus perpetuò acceptum referrent. Hoc tamen mihi si non licuit, id saltem quod potui omni studio, atque industriâ præstare conatus fui; juxta illud, quærite et invenietis, pulsate et aperietur vobis; Rursum, Vitulâ meâ nisi arassetis, non invenisseris. Nec falsò joculari jactatur adagio, Vaccæ lac dare non propter cornua, verum illas mulgendas esse. Scriptum enim est: Petite et dabitur vobis."—P. 79.

Students of the literature of the 17th century may read the description of the siege of Groningen (p. 135), but we may say with Munting: verum ut redeam, unde digressus fui, tempus me vocat.

We may conclude by giving the laudatory verses written by Theod. Uchteman in old French.

"A Monsieur Munting, Docteur et Professeur en l'Academie de Groninge et Omlande, de la Medicine (*sic*) et Botanique sur son livre de l'Herbe Britannique.

" O Medicin divin, Prince des Iardiniers
Que Febus te couronne avec ses cerds Lauriers.
Qui monstrés le premier par ta sage pratique
Quel soit l'echantillon de l'Herbe Britannique.
Par tant de siecles de tous scavants ignoré.
Pour ce labeur ton nom sera tousiours doré."

The curious use as well as absence of accents will be noticed. I have ventured to translate the lines, thus:—

Divine Physician, Prince of Gardeners! may
Apollo surely crown thee with his bay,
Whose wise research has first show to our ken
Herba Britannica's true specimen.
Ignored for ages by all savants olden
For this work shall thy name be always golden.

THE CRYSTALLIZATION OF PHOSPHORIC ACID.*

BY P. L. HUSKISSON.

The crystalline form of phosphoric acid was first noticed by Süersen, Steinacher and Stromeyer, who obtained it in well defined crystals by evaporating a solution of the acid until it had the exact composition of H_3PO_4, a result which was confirmed by Krämer in 1869.

Péligot, in a paper read before the Académie des Sciences in the year 1840, stated that fused metaphosphoric acid, left in a botttle several years, absorbed water and formed at the top transparent crystals of orthophosphoric acid, in the middle, a mother liquid of specific gravity 1·7, and at the bottom, opaque indistinct crystals of pyrophosphoric acid, resembling loaf sugar.

Quite recently, however, Mr. H. P. Cooper, in a paper read before the Pharmaceutical Conference, 1881, stated that he had been unable to start crystallization in a solution of phosphoric acid, even when concentrated to a specific gravity of 1·850, without the introduction of some foreign substance, and used crystals of sulphate of sodium for that purpose.

Having observed certain facts in connection with the crystallization of phosphoric acid, which seemed to point to a different conclusion, the following experiments were made upon the subject.

It ought perhaps here to be mentioned, that during the writer of 1880–81 several bottles of 1·750 acid phosphoric in my father's laboratory, suddenly and without any apparent cause, crystallized, and it was with these crystals that some of the following experiments were made.

Starting with one of these crystals, if it was dropped into an acid of specific gravity 1·750, it was observed that the moment it touched the liquid it began to grow and rapidly filled the flask, evolving at the same time a large amount of heat. The crystals thus formed were in prismatic plates, hard and transparent and at ordinary temperatures easily kept in that state, if enclosed in stoppered bottles.

Experiments were then made with phosphoric acid of different strengths, and an acid of specific gravity 1·750 was the highest and specific gravity, 1·660 the lowest, that could be crystallized at the ordinary temperature. The weaker acids ought at the time of crystellization, to be surrounded by water, as the heat evolved by the first few crystals forming is sufficient to redissolve them and prevent the formation of others. The shape of the crystals from the weak solutions is especially well defined; they are transparent and in prismatic needles.

Endeavours were then mode to start crystallization in an acid of specific gravity 1·750, with a number of other crystals, both of the same and other groups, but without success, the following crystals being used:—

Acetic acid glacial	Cadmium nitrate	Potassium iodide
Alum	Copper sulphate	Potassium nitrate
Ammonium nitrate	Iron sulphate	Potassiumsulphate
	Lead nitrate	Red potassium
Ammonium oxalate	Manganese sulphate	chromate
Ammonium phosphate	Mercurous nitrate	Silver nitrate
Arsenic acid	Oxalic acid	Sodium arseniate
Barium nitrate	Phenol	Sodium phosphate
Borax	Potassium bromide	Sodium sulphate
Boric acid	Potassium chlorate	Tartaric acid
		Zinc sulphate

It was then tried to crystallize some acid by concentration, evaporating carefully so as to prevent the formation of meta or pyrophosphoric acids; but although acid of the specific gravity 1·860 was obtained, no crystals appeared. Finally some acid of specific gravity 1·750 was evaporated for one hour, keeping it at 160° C. (320° F.), and the evaporation finished *in vacuo*, when some tabular transparent crystals were obtained, which as soon as they came in contact with the air changed their form and became opaque, giving out at the same time a large amount of heat. The different behaviour of this acid, in crystallizing *in vacuo* while stronger acids in the air refuse to do so, is due to the fact that the acid absor bs water very readily.

When these crystals are dropped into acid phosphoric of specific gravity 1·750 no action takes place, nor can crystallization be in any way induced at that strength; but at a gravity of 1·800 it will take place readily after a short time.

It is interesting to notice that if a crystal of the former acid be placed in some phosphoric acid of specific gravity 1·800, nothing results; but if a few drops of water be added so as to reduce the strength, crystallization immediately begins.

As the attempt to crystallize phosphoric acid of specific gravity 1·750 with sulphate of sodium failed, two samples of specific gravities 1·800 and 1·850 were prepared, and into each a crystal of sulphate of sodium was placed, well stirred and left for thirty-eight hours. At the end of

* Read at a meeting of the School of Pharmacy Students' Association, February 7.

this time both samples were carefully examined, but in neither had any crystals made their appearance.

The results of these experiments indicate—(1) That a solution of phosphoric acid cannot be crystallized by any means when the specific gravity is lower than 1·660 at ordinary atmospheric temperatures. (2) Solution of phosphoric acid of specific gravities 1·660 and upwards will not under ordinary conditions crystallize spontaneously or upon agitation. Neither can it be crystallized by the introduction of sodium sulphate or any other foreign crystal. When a crystal of orthophosphoric acid is introduced, crystallization at once commences. (3) Phosphoric acid having a specific gravity of 1·800 can be crystallized spontaneously by exposing over sulphuric acid *in vacuo*. The crystals then produced are unable to start crystallization in phosphoric acid of lower specific gravity than that from which they have been produced (1·800), and on the other hand the crystals obtained from weaker solutions are unable to induce crystallization in the stronger acid of specific gravity 1·800.

TRUFFLES.*

Among forgotten or forsaken industries in this country is that of gathering truffles. Truffle hunters and their dogs are alike extinct. In the last century, Gilbert White, of Selborne, living among beech woods, received a call in the month of August from a truffle hunter, who showed him several large truffles found that day. He gave some interesting information to the effect that truffles were not to be found in deep woods, but in narrow hedgerows and the skirts of coppices. In a thick beech wood the mass of roots so entirely occupies the ground, that nothing can grow. Sometimes, said the man, the truffles lie two feet under ground, sometimes at the surface, and those that lie deep, he affirmed, were more easily found by the dogs than the others, the shallow-lying ones having little or no smell. The price he asked for his truffles was half a crown a pound; they were in season in different situations nine months in the year, and were least abundant in wet winters and springs.

English truffles are now as much out of date as English wine, and for the same reason—the foreign growth is better, and is more easily obtained, as somewhat recent experiments in this country prove. Like the vine, they were found only in a few districts, requiring not only a warm situation, but a soil containing a considerable percentage of lime—2 or 3 per cent.; limestone soils therefore suited the truffle best. It is a parasitical plant living on the roots of trees. It is in fact a tuberaceous mushroom, which affects trees through the necessities of its growth, requiring, as it does, a large amount of phosphoric acid and of potash, which are supplied in the decay of the leaves annually shed from the trees. In England it is found among the beech woods of the chalk formation in Surrey, Sussex, Hants, and a few other districts, and thus it was erroneously supposed to affect beech trees only; but in France it is found on several limestone formations, and in connection with several sorts of trees, especially the chestnut, pine and oak. M. Chatin, a learned authority on the truffle and on agriculture, has published an exhaustive work on these vegetables from their germination to their appearance in a Perigord pie! Their growth, as a marketable crop, is exceedingly slow, and although the truffle harvest of France, reaped chiefly in a few districts of the South (though the truffle is found in fifty departments), yields 3,500,000 lbs. in weight, the growers receiving for it £400,000, and the retailers £1,000,000; still the crop is of Nature's planting and production, and it has not yet become a subject of cultivation. A good dog, or still better a sow, getting only a chestnut or acorn by way of wages for each find, will enable the hunter of the vegetable to bag 10 or 12 lbs. in one day in a good district, and these are worth £2 on the spot, and £4 or £5 in New York, London, Paris, or St. Petersburg. M. Chatin enlarges both on the dogs and pig, of Perigord. They are indispensable, and the latter are the most useful, being trained not merely to find the truffle but to uproot it and turn it out with their strong snouts, or lay it bare as their previous education may direct them. Dogs are chiefly used in Provence, and their obedience and acuteness are equal to that of the pigs, and their noses are almost as good, but they lack the faculty for uprooting the game. Each animal will scent the truffle from a considerable distance, lead the hunter to it, and stand to it, staunch as a pointer to a bird or hare, till the order is given to advance and take possession.

It is thought in France that truffle growing might be extended like fruit growing in England. Some say that ten times as many truffles might be grown. The difficulties, however, seem great. M. Chatin has not found the spores of this mushroom very manageable. The black truffle of Perigord ripens in October and remains in season through the winter. In the early spring it decomposes and the germs are set free and become mixed with the soil, ready for reproduction, after the manner of cryptogams of this class. White filaments are formed which accumulate into a mass, and from this mycelium the truffles grow, but, says M. Chatin, the tubers are incubated from this filamentous body only after a lapse of several years. The saying, "No trees, no truffles," indicates the position of their growth, and the experience of the Hampshire truffle hunter, that he found them on the borders of copses and hedgerows rather than in deep woods, indicates with accuracy some of the conditions of their growth. They require a light, dry soil, full of vegetable matter, and manured by the fall of leaves; but they are crowded out, like other vegetation, when the wood grows dense. Truffles accordingly are not found in young woods less than from six to ten years old, and the woods usually become too dense for them at thirty or forty years old. M. Chatin recommends the culture of the crop, and feels certain it would pay. He would plough the ground between the rows of young trees in a newly formed plantations, and plant the "tubers" in rows two yards apart, growing grain on the same ground for three or four years. In about six or eight years he would expect an abundant truffle harvest. Assisted by the pigs he would go on reaping a crop from year to year, till it might be necessary to begin upon the trees, thinning the timber for the sake of the truffles! We shall hope with M. Chatin that the supply of truffles may be increased tenfold, though undoubtedly the difficulties of cultivation are greater than in the case of mushrooms, for reasons which are obvious.

* From the *Gardeners' Chronicle.*

THE OPIUM TEST OF THE GERMAN PHARMACOPŒIA.*

The new edition of the German Pharmacopœia describes a method for the estimation of the morphia in opium and in three preparations made from it, and requires that the opium when thus assayed shall yield at least 10 per cent. of morphia. The object of a series of experiments, instituted by Dr. Geissler, was to ascertain to what extent the process was reliable.

The following are the details of the process prescribed by the German Pharmacopœia:—Eight grams of opium are mixed with 80 of water, frequently shaken during half a day (? twelve hours) and filtered; to 42·5 grams of the filtered liquid 12 grams of spirit, 10 of ether and 1 of liq. ammoniæ are added, the mixture is set aside in a cool place (10°–15° C.) and frequently agitated. After the lapse of twelve hours the precipitate is collected on a tared filter 8 centimetres in diameter, washed with a

* Abstract of a paper in the *Pharmaceutische Centralhalle*, 1883, Nos. 16 to 19.

mixture of dilute spirit, water and ether, in successive portions of 2 grains, and dried. It should weigh not less than 0·4 gram.

One part of the morphia thus precipitated dissolves completely in 100 parts of lime water, forming a yellow solution, which is coloured reddish brown by a little chlorine water and blue or green by solution of perchloride of iron.

The method is essentially the one devised by Prollius, and minutely described by Flückiger,* which has been criticized at length by Mylius† and van der Burg.‡

A sample of Turkey opium, guaranteed to contain 10 per cent. of morphia, was obtained from a drug house of high repute, and from it tincture and extract were prepared according to the pharmacopœial instructions.

The opium tested by the official method yielded 4·4 to 4·7 per cent. of morphia; the tincture, 5·2 to 6 2; the extract, 7·9 to 10·4 per cent. By allowing the mother-liquor to stand thirty-six hours longer these figures were increased to 7·7 to 8·1, 7·0 to 8·2 and 10·1 to 10·7 for opium, tincture and extract respectively. A second sample of opium, guaranteed to contain 10 per cent., yielded 8·0 to 8 3 per cent. in forty-eight hours; the tincture from the same gave 7·5 to 8·2 per cent. From a third sample of opium, however, as much as 13·7 to 14·1 per cent. were obtained. The time prescribed by the Pharmacopœia is, therefore, far too short; the amount, also, of morphia obtained from the tincture is larger than the percentage contained in the opium would lead one to expect.

Slight variations in temperature were found to be without appreciable influence on the result and constant agitation was also unsuccessfully tried.

Both Mylius and van der Burg have proved that a correction must be made to compensate for the morphia that remains dissolved in the mother-liquor; this correction is placed at 2·2 to 2·5 per cent. of alkaloid in the opium. If then the Pharmacopœia requires that 10 per cent. of morphia shall be obtained from the opium the quantity of alkaloid contained in the same must be 12 to 13 per cent.

A series of experiments was then undertaken to ascertain whether more morphia was retained in the mother-liquor of the official process than in that of other processes; and this was found to be the case.

The precipitated alkaloid was next tested with lime-water in which it should dissolve completely; this it failed to do, and a closer examination showed that the morphia precipitated by the German official process from infusion of opium contained varying amounts (15 to 18 per cent.) of narcotin; that precipitated from the tincture contained still more, hence the apparent excess of morphia in the latter, to which attention has already been directed. The narcotin was estimated by treating a weighed quantity of the powdered precipitate with *pure* chloroform, drying and weighing.

The author sums up his results as follows:--

The method of the German Pharmacopœia does not separate the morphia completely.

The morphia separated is at least not always pure.

The results are not uniform.

These objections may be urged against every method of estimating morphia that has yet been proposed, but the process of the Pharmacopœa Germanica leaves more in solution than others do and yields a less pure morphia. To comply with its requirements an opium must contain 12 to 13 per cent. of morphia.

In his concluding remarks Dr. Geissler expresses his approval of Mylius's volumetric estimation of morphia,§ but hopes soon to perfect a gravimetric method based upon the solubility of morphia in ammonia.

* *Pharm. Journ.*, [3], x., 254.
† *Archiv der Pharm.*, xv., 310.
‡ *Pharmaceutisch Weekblad*, Nov., 1879.
§ *Pharm. Journ.*, [3], xii., 6.

LUFFA ÆGYPTIACA.*

BY REINHARD J. WEBER, PH.G.

Description.—Luffa ægyptiaca, nat. ord. *Cucurbitaceæ*, is indigenous to Egypt and Arabia, and is a large climbing vine, with a thin, but very tough, light green succulent stem, attaining a length of from ten to thirty feet. The leaves are alternate and palmately lobed, of a light green colour and almost destitute of taste. The flowers are monœcious; petals five, united below into a bell-shaped corolla; anthers cohering in a mass; ovary two-celled, style slender, stigmas three. The fruit is elliptical ovate, fleshy and indehiscent, with a green epidermis, longitudinally marked with black lines, varying from ten to fifteen it number; under each of these lines is found a tough woody fibre. The fruit attains a length of from six to twenty-five inches. I have seen a specimen of the fruit grown in Allentown, Pa. which measured thirty-four and a half inches in length, and nine inches in diameter. When the epidermis is removed it presents a layer of interwoven woody fibres, which may be used like a sponge, being hard and rough when dry, and soft when soaked in warm or cold water; they absorb the latter with the same facility as the ordinary sponge, and have the advantage over the sponge not to wear out by ordinary use for a number of years; hence, the name of "Vegetable Sponge," or "wash rag," and its use as a flesh glove. The seeds are numerous, and are almost flat, broadly ovate, three-eighths of an inch long. The testa is of a blackish brown colour and rough, cotyledons almost flat, of a yellowish brown colour and oily.

Analysis.—An infusion of the epidermis of the fruit (1 to 10) was made and tested for tannin, with tincture of chloride of iron, with sulphate of iron, and Russian isinglass, whereby a trace of tannin was shown. One hundred grains of the epidermis, thoroughly dried, yielded fifty-four per cent. of residue; on being incinerated at a low heat, the epidermis (dry?) yielded twelve per cent. of a dark grey ash, one half of which was soluble in water; the ash consisted of silica, carbonates and sulphates of potassium and calcium. The fibrous portion, after being incinerated, yielded sixteen per cent. of ash, partly soluble in water.

The fruit contains a large amount of mucilaginous substance, which yields a white precipitate with solution of subacetate of lead.

An infusion of the fibrous portion, when evaporated to a syrupy consistence, became gelatinous on cooling. The gelatinous mass had all the properties of bassorin, and was free from starch. One troy ounce of the epidermis was powdered, and successively exhausted with benzin, alcohol and water. The benzin solution yielded a small quantity of yellow colouring matter; the alcoholic tincture left chlorophyll and a little extractive, and the infusion gave twenty per cent. of slightly bitter extract.

One troy ounce of the powdered seeds was treated with boiling benzol; the green solution, on being evaporated, yielded two and a half per cent. of a brown, fatty oil, and twelve per cent. of a green mass. The latter, on being treated with very dilute hydrochloric acid, and evaporating the liquid, yielded a minute amount of crystals. Similar crystals were also obtained from the green alcoholic extract of the seeds previously exhausted with benzol. Water afterwards took up nothing of note.

Mode of preparing the fibrous portion.—The fruit is cut longitudinally on one side, stripped of the epidermis, the seeds are then removed, and the network of fibres is washed thoroughly to get rid of the mucilaginous substance and dried. It is then ready for use. This fibrous portion is the only part of the plant, as far as I know, that has ever been in use.

* From the *American Journal of Pharmacy*, January, 1884

The Pharmaceutical Journal.

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Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE LAWS RELATING TO ARSENICAL PIGMENTS AND OTHER POISONOUS SUBSTANCES IN FOREIGN COUNTRIES.

ABOUT twelve months since, a Committee of the National Health Society, appointed for the purpose of considering the injuries arising to health from the use of arsenical and other poisonous pigments in the tinting of wall-papers and textile fabrics and for other industrial purposes, applied through its Chairman, Mr. ERNEST HART, to Earl GRANVILLE to instruct the agents of the Foreign Office at courts on the continent of Europe and in America to report on the legislation affecting this subject existing in other countries. In compliance with this request a circular was immediately afterwards issued from the Foreign Office giving the necessary instructions, and the consequent reports have just been issued in the shape of a paper presented to Parliament by command of Her Majesty. Besides the information relating to foreign legislation having for its object to restrict or safeguard the manufacture, use, or sale of arsenical and other poisonous pigments, which was the special object of the inquiry, there are scattered through the reports various incidental references to regulations affecting the sale of "poisonous substances" in different countries by persons other than pharmacists, which are of special interest at the present moment.

Turning, however, first to the special subject of the return, we find that reports have been received from British representatives at twenty-two different courts. Several of these reports may be at once eliminated from consideration as negative. Thus, in Belgium, France, Italy, Netherlands, Portugal, Servia, Spain, Switzerland and the United States, there are no special laws relating to the use of arsenical or other poisonous pigments. Respecting these countries nothing need be said at present except that in France a circular was sent out some years ago cautioning manufacturers as to the responsibilities incurred in using poisonous pigments, in Greece the use of poisonous colours in confectionery and liqueurs is prohibited, in Italy a law on the subject is being prepared, and in the Netherlands it is considered that the ground is practically covered by penal laws dealing with the selling of merchandize known to be dangerous without a special warning. The list may be further reduced by grouping Baden, Bavaria, Hesse-Darmstadt, Saxe-Coburg-Gotha, and Saxony together with Germany, since practically they are all regulated by an Imperial decree issued in 1882, which forbids the "use of colours containing arsenic for "the preparation of wall-papers, and of colours "containing copper and arsenic for dyeing stuffs for "clothing," and also the sale of articles of clothing dyed with these poisons. In Austria the employment of arsenical pigments for colouring wall-papers, artificial flowers, textile fabrics or papers is prohibited; also the employment of aniline or mineral colours in the manufacture of articles of consumption, or of mineral colours containing copper, arsenic, lead, or zinc in stuffs intended to come in contact with the human body, as well as the application of litharge or bad enamel to table and kitchen utensils. In Denmark the use of arsenical compounds for staining, dyeing or colouring, or preparations of lead for toilet articles, or oxide of zinc in india rubber ware is strictly forbidden. In Roumania there is no provision as to wall-papers, but the use for wrapping purposes of paper coloured with poisonous pigments is prohibited. Russia has stringent statutes against the importation, sale or manufacture of papers or textile fabrics coloured with arsenical pigments, or the importation of aniline colours otherwise than in crystals, or the use of "papier nacre,' which is covered with an enamel containing lead. Lastly, Sweden is officially described by its State Board of Health as being just now under the influence of a "fashionable arsenical panic," the force of which may be estimated by the fact that the number of analyses for arsenic indulged in by the Swedish public reaches at least ten thousand annually. In that country, as in others, "different analysts arrive at different results," and, as one analyst, at least, is said to pronounce, without further examination, "every crystallization in the tube, even though it be scarcely perceptible, to be arsenic," it is not surprising that the panic is maintained and that regulations are enforced in a manner that sometimes proves very inconvenient to manufacturers and importers.

With respect to the second topic alluded to, the bearing of which upon the Draft Pharmacy Bill will be evident, it appears that the Hessian Police Code draws a distinction between "direct poisons," which can be legally sold only "apothecaries and druggists," and substances of a "poisonous nature," which may be sold under certain precautions to adults by any grocer holding a special police licence. The list of these "poisonous" articles includes the mineral acids, metallic pigments and certain vegetable substances "commonly used in art and industry." In Russia poisons are divided into four classes, one of them being described as "poisonous and violently acting substances employed in manufactures and not well adapted to criminal purposes." It appears that this

class, which includes the mineral acids, oxalic acid, potassium cyanide, sugar of lead, arsenical and copper pigments, etc., may be sold in ordinary business transactions by "merchants of the two guilds," subject to certain conditions, amongst which are the holding of a licence and registry of sales; but at fairs the sale of these "poisonous and violently acting substances" is unrestricted. In Servia poisons and poisonous articles may be sold by "authorized merchants" only to persons who have received special permission from the police to purchase. In Sweden such "poisonous substances as are used for generally occurring technical or domestic purposes," provided certain conditions as to storage are complied with, may be sold by any person legally carrying on business who shall deliver to the authorities a written specification as to the poisonous substances he proposes to keep for sale. But it is worthy of note that the same substances may be sold by a pharmacist, only under much more stringent conditions. One more regulation, issued by the municipality of Bucharest, may be referred to rather for its oddity than its importance. The municipality, believing that cases of poisoning are often produced by the use of poisonous cosmetics, and having received frequent complaints that several hairdressers, perfumers, "and even chemists," of the capital have been selling cosmetics containing lead and mercury for the tinting of the face, and "seeing that several women of the capital make and sell the same poisonous cosmetics," forbids the sale within the limits of Bucharest of any cosmetics, or similar washes, pomades or powders, containing preparations of lead or mercury.

THE CHEMIST AND DRUGGIST IN JAPAN.

A Report upon taxation and land tenure might seem to be a most unpromising exploring ground for information relating to the practice of pharmacy or what most nearly represents it in a particular country; but, nevertheless, the reader of a Report on this subject by Mr. Gubbins, an *attaché* to the English Legation at Tokio, recently submitted to Earl Granville, may find imbedded in it, like a fly in amber, an interesting summary of the conditions under which drugs and medicinal preparations are supplied to the Japanese public. The particulars given correspond fairly well with the statement made in Isabella Bird's recent work 'Unbeaten Tracks in Japan'; but as in the Report they are somewhat more fully stated, and probably few of our readers will have an opportunity of consulting the book, we may be excused for transferring the gist of them to these columns.

According to Mr. Gubbins, the "profession of a druggist" in Japan does not coincide with that of a foreign "apothecary." This latter word, we presume, he uses in its pharmaceutical aspect; for he adds that before the country was open to foreigners, there was no such class, the sale of medicine having been confined to "doctors," who either supplied medicines prepared by themselves according to original recipes or according to prescriptions of others, or, perhaps more commonly, sold medicines already prepared and known to practitioners and patients by the names of "doctors" who compounded them. About the year 1877, apparently in consequence of the encroachment of foreign medical science upon native systems of medical treatment, the supply of medicines became the subject of legislative enactments, and for the purposes of taxation persons engaged in it were divided into three classes,—druggists, retail dealers and itinerant sellers of medicine. It would appear, however, that the members of one only of these three classes, the "druggists," enjoy the privilege of preparing medicines, though this is not made quite clear in the Report; at any rate they differ from those in the other classes in being more heavily taxed, and in paying their taxes into the national exchequer. The taxation is imposed in a form not calculated to encourage the multiplication of specialties, a tax of two yen yearly (about 7*s.* 6*d.*) being payable on each separate medicine prepared and sold by the druggist, besides which he must hold a licence to sell, renewable quinquennially, for which he pays a fee upon taking it out and renewal at the rate of 20 sen (about 9*d.*) for each medicine. The term "prepared medicines" is defined as comprising medicine in a liquid form, and in the form of pills, ointments and powders. The details of the composition, weight and taste of each separate medicine, of its alleged medicinal properties and of the dose have to be furnished to the Home Office at the time of making application for a licence to sell it; power being reserved to the Home Office to refuse a licence in the case of any medicine which might be considered dangerous. Even here the limit of taxation to which the Japanese "druggist" is liable is not reached, for he has to attach to all drugs sold a stamp representing 10 per cent. of their price, which is fixed by Government. The pettiness of this tax may be estimated from the fact that the first item of the regulation provides that on medicines of the price of 1 sen (less than a halfpenny) a stamp of 1 rin (about one-twentieth of a penny) shall be affixed. The penalties for breaches of these regulations range between 7*s.* 6*d.* and £3 15*s.*, the latter penalty being for the sale of unstamped medicines. In a recent report Mr. Consul Robertson made the remark that patent medicines, or drugs put up in a popular form, are greatly in vogue in Japan, and that a good many imported articles go into consumption in this shape. He also stated that an intimation that a tax would be imposed upon these remedies had already seriously affected the business, and was thought likely to operate still further to its disadvantage. The Japanese authorities, however, do not appear to share this anticipation, since the financial budget for the present year includes an estimated increase of revenue from this source amounting to

600,000 yen, or about £110,000. The tax paid by "apothecaries" and "medicine pedlars" is a local one, and is in the form of an annual licence for which the fee is £3 15*s*.

An Evening Meeting of the North British Branch of the Pharmaceutical Society will be held in the Society's Rooms, 119A, George Street, Edinburgh, on Wednesday next, when the papers read will be on "The Composition of Potassæ Sulphas cum Sulphure," by Messrs. Maben and Deehan, and on "The Morphology and Physiology of the Cell," by Mr. Patrick Geddes. The chair will be taken at 8.30.

* * *

We learn from the New York *Pharmaceutische Rundschau* that a Bill has been introduced into the House of Representatives at Washington and ordered to be printed which would provide for the preparation of a legally authoritative National Pharmacopœia of the United States. It proposes that with this object the Finance Minister should appoint two officials of the United States Marine Hospitals, the War Minister two officials of the Military Medical Department, and the Minister of Marine two officials of the Naval Medical Department, in order to carry out the work, and that these officials should invite the American Medical Association and the American Pharmaceutical Association each at its next annual meeting to select three of its members to form a Committee to act jointly with them in preparation of such a work. The Joint Committee would be empowered to elect a President and a Secretary from its midst, and to supply any deficiency in its number by the election of new members. The printing and publishing of the official Pharmacopœia would be in the hands of the Committee and the work would have to be revised every ten years. The Bill also provides for a grant of five thousand dollars for payment of the expenses necessarily incurred in carrying out the measure.

* * *

The Registration of Firms Bill, referred to last week as having been read a first time in the House of Commons, has now been issued and proves to be similar to the Bills introduced in previous years. It provides that every firm carrying on business in the United Kingdom under a firm-name which does not consist of the full or the usual names of all the partners or all the acting partners without any addition, and every person carrying on business under a firm-name consisting of or containing any name or addition other than the full or usual name of that person, shall effect registration in a prescribed manner. The register, which is to be open to public inspection for a small fee, is to show the firm-name, the nature of the business, the place or places of business, and the full name, usual residence, and other occupation of any of the person or persons carrying on or intending to carry on the business. Upon any change occurring in the constitution of a firm the members of the firm as reconstituted would have to furnish information as to the change within a month; any change in the firm-name would involve fresh registration *de novo*. It will be evident that the existence of such an Act would in certain cases greatly facilitate the performance of the duties of the Registrar under the Pharmacy Act.

A Bill, introduced into the House of Commons by Mr. Kennard, having for its object to repeal such sections of any Act of Parliament as enable mixed traders, other than duly licensed victuallers, to deal in the retail sale of spirits and liqueurs, contains a provision that nothing in it shall affect or apply to —among other things—"the sale of medicated or methylated spirits, or spirits made up in medicines and sold by medical practitioners or chemists and druggists." The juxtaposition of the first two articles mentioned, and indeed the tenour of the whole clause, is suggestive of a very limited acquaintance on the part of those who drafted the Bill of the conditions under which either medicated or methylated spirit is sold.

* * *

As the esteemed editor of our medical contemporary, the *Lancet*, appears to be engaged in studying the proclivities of various journals, as indicated in the announcements made in their advertising pages, we hope he will not overlook one in the columns of his own journal for last week, in which a surgeon, enjoying the possession of commanding premises at the West-end, advertises "a fine opening for a chemist's business or *surgeon's retail*."

* * *

The commercial samples of liquid starch sugar, or "glucose," examined by the Committee appointed in the United States to investigate the subject, to which reference was made last week, were found to contain from 34·3 to 42·8 per cent. of dextrose, 0 to 19·3 per cent. of maltose, 29·8 to 45·3 per cent. of dextrin, and 14·2 to 22·6 per cent. of water. The samples in the solid form—"grape sugar"—ranged in composition from 72 to 73·4 per cent. of dextrose, 0 to 36 per cent. of maltose, 4·2 to 9·1 per cent. of dextrin, and 14 to 17·6 per cent. of water. Three specially prepared samples of "grape sugar" contained respectively 87·1, 93·2 and 99·4 per cent. of dextrose, the last being "crystalline anhydrous dextrose." The ash in the "glucoses" varied between 0·325 and 1 per cent., and in the "grape sugars" between 0·335 to 0·75 per cent. The reporters add that in the United States starch sugar is chiefly used in making table syrup and artificial honey, in brewing and vinegar making, as well as in the adulteration of cane sugar and as a substitute for it in confectionery and canning fruits. It is estimated by the Committee that the industry in the United States gives employment to twenty-nine factories, which together represent a capital of £1,000,000, consume about forty thousand bushels of maize daily, and produce "glucose" and "grape sugar" to the value annually of £2,000,000.

* *

We are requested to state that in consequence of the great demand for tickets, the annual dinner of the Chemists' Assistants' Association, which takes place at the Holborn Restaurant on the 20th inst., will be held in the Venetian Room (Grand Entrance), and not in the Duke's Saloon as advertised.

* * *

At the next meeting of the Chemical Society, on Thursday, the 21st inst., there will be a ballot for the election of Fellows, and a paper will be read on "An Analysis of Spotley Bridge Spa Water," by Mr. H. Peile.

Transactions of the Pharmaceutical Society.

In the List of Apprentices or Students, page 630,
Wilson, John.....Aberdeen,
should be
Wilson, John.....Wolverhampton.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council was held on Wednesday, February 6; the President, Mr. James E. Brunker, M.A., in the chair.

Present:—Mr. H. N. Draper, Vice-President, and Messrs. Allen, John Evans, Grindley, Hayes, Hodgson, McIlwain, Dr. R. Montgomery, Dr. Aquilla Smith and Professor Tichborne.

The Registrar read the minutes of the last meeting, which were confirmed.

A letter was read from Dr. Kaye, Q.C., clerk to the Privy Council, enclosing an Order of Council confirming the resolution of December 5, 1883, relative to the time to be spent in learning practical pharmacy.

The President: The new regulation requiring four years to be spent in the learning of practical pharmacy came into force from January 1 last, and is now law.

A communication was received from the Attorney-General for Ireland, forwarding his replies to the following queries:—

"*Queries* submitted to counsel on behalf of the Council of the Pharmaceutical Society of Ireland:—

"The Council have been entrusted with the duty of administering the Pharmacy Act, Ireland (38 and 39 Vict. c. 57), and have been empowered to make regulations which, subject to the approval of the Lord Lieutenant and Privy Council (sec. 17) have the force of law. The Council have found difficulty in construing the legal interpretation of the term 'person keeping open shop,' how far it may extend, or how it may be limited (*vide* sec. 30).

"On this point counsel's opinion is sought. The following case now before the Council illustrates the difficulty. Candidates presenting themselves for the licence of the Society must produce certain certificates from a pharmaceutical chemist or apothecary keeping open shop (*vide* p. 55 of the Society's Calendar). A Mr. Hardy, a licentiate of the Society, seeks for recognition of his certificates under this regulation, but under the circumstances detailed below. A firm named Beater and Co., carrying on business at 17, Lower Sackville Street, as 'general druggists,' have entered into an arrangement with Mr. Hardy, who is one of the partners of that firm, under which he rents from the firm a portion of the premises in which the general drug business is carried on, as a compounding department. It appears that the profits of the compounding department are exclusively enjoyed by Mr. Hardy; but it also appears that the department is only a portion of the general business shop, and that there is a common entrance to both, the name on the door being 'Beater and Co.' The case in question is a comparatively unimportant one, but will govern others which may arise. Counsel will please advise—

"1. Whether the singular 'person' can be held to imply and include 'persons' under the Irish Pharmacy Act, or if there is any general interpreting Act in the Irish statutes affecting the point? Counsel's attention is directed to an English case, The Pharmaceutical Society of Great Britain *v.* the London Supply Association, 5 Q. B. D., p. 310, which was finally adjudicated on in the House of Lords. It is necessary to keep in mind that the Irish Act, though closely following the Pharmacy Act (Great Britain), 1868, is not, owing to antecedent circumstances, on all fours with it. In Great Britain any person before the passing of the Pharmacy Act could compound physicians' prescriptions; while in Ireland the right to compound prescriptions formerly enjoyed by apothecaries only is now extended to licentiates of the Pharmaceutical Society and to no others.

"2. Can physicians' prescriptions be legally compounded in Ireland by a firm of whom one or more members are not qualified pharmacists; or does the licence only extend to the individual licensee who conducts his business on his own premises and for his own profit?

"3. Can a firm in general business or co-operative society conduct a dispensing department under the management of a qualified pharmacist within their own premises, even though such qualified manager is the ostensible owner of said department?

"4. Can Mr Hardy in the case specially referred to be regarded as a pharmaceutical chemist legally keeping open shop in the terms of the Society's regulation referred to?"

"*Opinion*: Having regard to the Statute 13 and 14 Victoria, chap. 21, sec. 4, words in the singular used in a statute include the plural and therefore 'person' includes 'persons.' As regards Mr. Hardy's case, having regard to the fact that he is the sole proprietor, as I understand, of the dispensing portion of the business, I think he may be fairly regarded as 'keeping open shop' within the meaning of the regulation at page 55 of the Calendar.

"As regards the second question in the case, in my opinion if a firm, not being an incorporated company, consists of persons, some of whom are not properly qualified pharmacists, such firm cannot legally compound prescriptions. In such case the licence granted only extends to the person to whom it is granted, so as to authorize him to conduct business on his own premises.

"As regards the third question in the case, I assume it refers to the case of firms or societies incorporated under the Companies Acts or otherwise. As regards such companies, having regard to the decision of the House of Lords in the case of the Pharmaceutical Society of Great Britain *v.* the London and Provincial Supply Association, Limited, 5th Appeal Cases, p. 857, they may keep and conduct a dispensing department provided the person actually managing and conducting such department is himself a properly qualified chemist.

"Reply to fourth query as to Mr. Hardy: I think he can."

The President: This reply is in some respects a rather serious thing for the Society, and shows the necessity for pressing for an amendment of the law. It appears to be an extraordinary anomaly that Brown, Jones or Robinson if they form an incorporated society can do what none of them individually can do by himself.

Mr. Draper: It is a *reductio ad absurdum*.

Dr. Aquilla Smith: The whole thing amounts to an evasion of the Act of Parliament.

Mr. Hayes: I suppose Sir John Arnott and Co. could set up a dispensing establishment in their house.

Mr. Draper: They could, because they are a limited liability company.

The President: Among the proposed amendments in the Act we have propositions touching this very point. The English Society have in their draft Bill a similar clause, which, it is to be hoped, will be passed into law. I have written to the President of the English Society asking for a copy of their draft Bill of this year, as I do not know whether any change has been made in it since last year. The first practical result of the communication we have received is that we must inform Mr. Hardy that, as the law has been interpreted to us, the course which he has adopted is not contrary to law. In Mr. Hardy's last communication to the Council he took exception to some remarks that I had made at a meeting of the Council and required me to withdraw them. I have nothing to withdraw. What I said I still adhere to, namely, that

Mr. Hardy had made elaborate preparations to evade the law, whether successfully or not remained to be seen. It appears now that he is so far successful, according to the way in which the law has been interpreted. I withdraw nothing that I have said. I do consider it an evasion of the law.

Mr. Grindley said he was averse to giving Mr. Hardy any answer in the matter.

The President said it was only right that a copy of the queries and answers should be sent to Mr. Hardy. Of course a lawyer's opinion did not settle the law. That could only be done by the decision of a Court of Justice; but he thought it would be unwise for the Council to go into Court with that opinion staring them in the face.

Mr. Allen: Can a person situated as Mr. Hardy is call his portion of a shop a "dispensing establishment?" It is really an establishment in itself according to the position which Mr. Hardy takes up. Questions may arise in the case of apprentices, as to what department they were engaged in.

The President said there was a clause in the proposed amended Bill empowering the Registrar of the Society to send to any questionable establishment a notice requiring the *bonâ fide* proprietor to state within a limited time who he is. For default in the making of that reply a penalty was provided; and also for carrying on business, and acting as owner, during default in making such reply a penalty was provided. This would be a most useful clause.

It was then resolved, on the motion of Mr. Hayes, seconded by Mr. Evans—

"That a copy of case and replies be forwarded to Mr. Hardy."

A letter was read from Mr. Robert J. Downes, suggesting alterations in the bye-laws of the Society.

The letter was referred to the Law Committee.

The next business was the consideration of a report from a deputation which had recently waited on the Chief Secretary for Ireland in reference to the amendment of the Pharmacy Act.

The President said they might take the report which appeared in the *Freeman's Journal*, of what occurred at the deputation, as it appeared to be the most accurate. All who attended the deputation must have been pleased at the favourable reception which they got from Mr. Trevelyan. He appeared to have gone thoroughly into the questions, and took up the points that were presented to him at once. He (the President) had not expected that before they left the room they should have received what was tantamount to a pledge, that, as far as possible, what they asked for would be carried out. The Chief Secretary asked them to put in writing exactly what they wanted, and the sooner that was done the better. He (the President) had drafted the heads that had already been agreed on by the Council, and had written to the President of the English Society, asking for a copy of the Bill which his Council were promoting, in order that the two Societies might, as far as possible, work on the same lines. If Government should bring in Bills for the two countries at the same time it was probable that the two Bills would be identical in some points. It was desirable to have a meeting of the Pharmacy Act Amendment Committee as soon as possible, in order to prepare the written statement for which Mr. Trevelyan had asked; it was also advisable that that statement when agreed upon should be printed, and copies of it sent to Irish members of Parliament.

Professor Tichborne said it would be very wrong to force a Bill through Parliament without consulting and getting the opinions of the members of the Society generally. The Council would not be bound to follow out whatever might be agreed to at a general meeting; but they were bound to place not only their own opinions but those of members of the Society generally before the Chief Secretary.

On the motion of Mr. Allen, seconded by Mr. McIlwaine, it was resolved that the Pharmacy Act Amendment Committee be requested to draw up, for the information of the Chief Secretary for Ireland, a *résumé* of the views of the Council as to the amendment of the present pharmacy laws.

A report was submitted by a committee to whom the subject of the supply of the *Pharmaceutical Journal* to the members of the Society had been referred. It was recommended that, as the finances of the Society did not justify so large an expenditure, the proprietors of the Journal should be asked—(1) if any further reduction could be made in the cost of supply; (2) whether in the event of the Society discontinuing the present arrangement they would supply the Journal to such members as desired to have it, on the same terms as at present, on being guaranteed a certain number of subscribers. The report stated that the latter of these courses was the one which the Committee would prefer.

After some discussion,

On the motion of Professor Tichborne, seconded by Mr. Hayes, it was ordered that the inquiries suggested by the report should be made before it was adopted.

Mr. John Armstedt Ray, of 15, Nassau Street, Dublin, was elected a member of the Society.

Mr. Hodgson made a statement, the effect of which was that £160 worth of stock had been sold out to meet the expense of fitting out the Society's new premises; that £128 had been expended; and that one bill remained unfurnished, the amount of which would probably not exceed £30.

Some accounts having been ordered to be paid, the Council adjourned.

The following gentlemen passed the examination for the licence as Pharmaceutical Chemist, held on January 2 and 3, and were registered as such on February 6:—

James Guiler, 25, High Street, Belfast,
William James H. Madden, Circular Road, Dublin,
David Stranaghan, 141, York Street, Belfast.

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION OF GREAT BRITAIN.

A meeting of the Executive Committee was held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on Friday, February 8, at 12.45 p.m.; Mr. John Harrison (Sunderland), President, in the chair; Mr. Cross (Shrewsbury), Vice-President.

Present—Messrs. Andrews (London), Arblaster (Birmingham), Barclay (Birmingham), Chapman (Scarborough), Churchill (Birmingham), Hampson (London), Holdsworth (Birmingham), Jervis (Sheffield), Jones (Llanrwst), Mackenzie (Edinburgh), Mason (Liverpool), Parker (Nottingham), Paterson (Aberdeen), Southall (Birmingham), Symes (Liverpool), Williams (Manchester), Yewdall (Leeds), and the Solicitor.

The minutes of the previous meeting of the Executive were read and confirmed.

The Secretary said in accordance with the instructions of the Executive he made arrangements for a deputation from the Association to wait upon the Commissioners of Inland Revenue at Somerset House, for the purpose of urging upon them the advisability of issuing an order making it compulsory on Excise officers, when purchasing spirit for analysis, to leave with the seller a portion of the spirit sold. The interview took place on September 25 last, and the following general order had since been issued from the Inland Revenue Office:—

"Ordered—

"That the attention of the service be directed to the following matters:—

"First. Samples of methylated spirit or finish.—Officers purchasing samples of methylated finish or methylated spirit from persons not licensed to retail methylated spirit are to obtain not less than one pint

and a half, and this quantity is, in the presence of the trader, to be divided into three equal portions in accordance with the general instructions on the subject of samples. Sound corks are to be used and tied down with string, the knot being placed in a notch in the top of the cork and sealed. One of the subdivided samples to be offered to the trader (who should be informed that a sample will be tested as to the amount of resin, if any, dissolved therein), and a second is to be retained by the purchasing officer, and the remaining sample is to be sent at once to the laboratory for analysis.

"Any such purchase is to be reported without delay in order that the trader may receive early notice of any offence against the law.

(Signed) "CHAS. B. FORSEY."

The report of the Finance Committee was then received and adopted.

The Secretary was then instructed to prepare a statement showing the cases of prosecution and defence in which the Association had taken part, since its formation in 1876, together with the total expenditure during the same period, and to issue a print of the same with the annual report in May next, accompanied by a circular appealing for additional support for the Association.

The President said that at the last meeting of the Executive a deputation was appointed to wait upon the Pharmaceutical Council in reference to the proposed amendments of the Pharmacy Act. That the interview had taken place on November 6 last, and that the proceedings, at the request of the President of the Pharmaceutical Society, were not reported. At that interview a long discussion took place on the amendments proposed by the Executive of the Association to the Draft Pharmacy Bill prepared by the Pharmaceutical Council, when it was ascertained that the Council had already settled the lines of the measure with the Privy Council. Since that time, he and the Vice-President had, at the request of the President of the Pharmaceutical Society, again waited upon the Law and Parliamentary Committee of that body in reference to the matter, and a communication had been received from the Society which the Secretary would now read.

"Pharmaceutical Society of Great Britain,"
"17, Bloomsbury Square, London, W.C.,
"*January 24th*, 1884.

"The Secretary,
"Chemists nnd Druggists' Trade Association of
"Great Britain, Birmingham.

"Dear Sir,—It has been decided by the Council that it is desirable to ask the Privy Council to receive a deputation to urge the importance of introducing a Bill to amend the Pharmacy Act this session.

"With reference thereto, I am instructed to invite the Executive Committee of your Association to appoint a small deputation to accompany a deputation from the Council of this Society, and possibly others, to the Lord President of the Privy Council in support of legislation on the basis of the Bill now in the hands of the Government. "I am, yours faithfully,

(Signed) "ELIAS BREMRIDGE,
"*Secretary and Registrar.*"

After a very long and full discussion the following resolutions were passed :—

"That a small deputation be appointed to accompany a deputation from the Council of the Pharmaceutical Society to the Lord President of the Privy Council in supported of legislation on the general basis of the Bill to amend the Pharmacy Act now in the hands of the Government."

"That the deputation consist of the President, Vice-President, Mr. Barclay and the Secretary."

"That the officers of the Association, together with Messrs. Arblaster, Barclay, Hampson and Holdsworth, be appointed a committee to watch the progress of the Bill to amend the Pharmacy Act Amendment Bill in its passage through the Legislature."

It was moved by Mr. Mackenzie, seconded by Mr. Chapman, and unanimously resolved—"That the Eighth Annual General Meeting of the members of the Association be held in London on Tuesday, May 20 next, and that the arrangements for the same be left in the hands of the London Committee."

Mr. Jervis gave notice that at the next Annual Meeting he intended to bring forward a resolution proposing to amend Rule 6, so that for the future the officers of the Association should be elected by and from the Executive Committee instead of by the Annual Meeting as heretofore. He said he thought that it was very advisable that the Annual Meeting should elect the Executive Committee, but that, in his opinion, the Executive should be permitted to elect their own officers.

Mr. J. C. Arnfield was then appointed Local Secretary to the Association for Ashton-under-Lyne and district, *vice* Mr. William Bostock, resigned, and Mr. R. Newby, Local Secretary for Truro and district, *vice* Mr. Serpell, resigned.

A communication was read from Mr. Pipe, of 1, King's College Road, London, N.W., enclosing a donation of a guinea to the funds of the Association, and thanking the Executive for defending him in the action under the Sale of Food and Drugs Act recently brought against him by the parish authorities, and a similar communication from Mr. Sidney Allchin, of England Lane, London, N.W., enclosing a donation of five guineas towards the funds of the Association.

The President called attention to the retirement of Mr. A. H. Mason from the Executive Committee, as he was now about to leave this country for Canada, and bore testimony to the important services rendered by that gentleman to the Association.

On the motion of the President a resolution was passed acknowledging the value of the services rendered by Mr. Mason, and expressing a wish for his future welfare.

Several letters were read from members of the Association, and instructions given to the Secretary as to the manner in which he should deal with the same.

ABERDEEN CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A meeting of this Association was held on Friday, January 25, in the Chemistry Class-room, Marischal College, when Professor Brazier, F.C.S., Aberdeen University, delivered a lecture on "Vacuum Tubes."

In introducing the subject, reference was made to the phenomena of induction and electro-magnetism; then followed a description of the intensity coil, and a comparison was drawn between it and the electrical machine with reference to the subject in hand. The Professor then proceeded to illustrate the lecture by showing his splendid collection of tubes, pointing out any peculiarity connected with each. The fluorescence of quinine, the probability of producing light by means of tubes, and the phosphorescence displayed by several, after the current had ceased, were briefly touched upon. After further consideration of the subject, he remarked that although many of the experiments shown appeared of no practical use, still it was very probable that further investigation might prove them to contain the germs of future important discoveries.

Bailie Paterson, at the close of the lecture, in a few felicitous remarks, proposed a vote of thanks to Professor Brazier, which was heartily accorded.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The seventh meeting of the sixth session was held in the Pharmaceutical Society's rooms, 119A, George Street, Edinburgh, on Wednesday evening, January 30, at 9.15; Mr. Claude F. Henry, President of the Association, in the chair.

The minutes of the previous meeting having been read and confirmed, the Chairman called upon Mr. John R. Hill to read a paper on the "Official Alkaloids."

After giving a brief historical *résumé* of the various and important discoveries in alkaloidal chemistry since Sertürner in the year 1804 discovered the alkaloidal properties of morphia, Mr. Hill, taking the official alkaloids in their chronological order, proceeded to describe their chemistry and preparation, and illustrated his subject with a number of experiments, showing the principal reactions with colour reagents and precipitants, and described by means of graphic formulæ the artificial formation of bodies analogous to alkaloids.

The Chairman, in proposing a vote of thanks to Mr. Hill, referred to the amount of valuable information which he had brought before the meeting, and illustrated as the paper was by such elaborate experiments, he was confident it had been both interesting and instructive to the members.

Mr. MacEwan seconded the motion, which was cordially awarded.

A discussion followed, in which Messrs. Crowden, Thomas, Stephenson and Turnbull took part.

Mr. Hill briefly replied.

A number of queries were then submitted and replied to by Messrs. Hill, MacEwan, Robbie and Turnbull.

The Chairman having intimated that at the next meeting Mr. Wm. Pirie will read a paper on "Mineral Waters," the meeting adjourned.

The first annual *soirée* and assembly of this Association was held on Friday, the 1st inst., in the large hall of the Literary Institute, South Clerk Street, Edinburgh. The hall was effectively decorated with flag trophies, bannerets, etc., and when the company, numbering about two hundred, had assembled, it presented a very gay appearance. At half-past eight o'clock, the chair was taken by the President of the Association (Mr. C. F. Henry), who was accompanied to the platform by Dr. Inglis Clark, Messrs. Aitken, Beaumont, Fidler, MacEwan, Robertson, Turnbull and others.

After reading letters of apology from Mr. John Nesbit, (President of the North British Branch) and Mr. J. R. Young, the Chairman proceeded to give a welcome to the guests. In the course of his remarks he stated that the annual reunions which the Association had previously had were found to draw out only a portion of the young pharmacists of Edinburgh and district, while ladies were entirely excluded. It was with the hope of further extending the brotherly feeling which the Association could lay fair claim to have engendered in local pharmacy that the reunion had been remodelled. He now gave the ladies a hearty welcome in the name of the Association and hoped they would thoroughly enjoy the evening's entertainment which the Committee had provided. He concluded by remarking that the reunion was not merely an Association meeting, but was intended for all connected with pharmacy, and he hoped all would co-operate with the Association in making future reunions successful.

After tea had been served, a lengthy programme of vocal and instrumental music was gone through, humorous readings being also contributed.

After the completion of the programme, Mr. MacEwan in the name of the Association thanked the ladies and gentlemen who had contributed to the evening's enjoyment. The Committee had endeavoured to make the meeting an enjoyable one, and he was sure all could say it had been a success. At future meetings their efforts would be extended and everything done to make the reunions a feature in Edinburgh pharmacy.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

The second monthly meeting of the session was held in the Owens College on Tuesday evening, January 29. Mr. F. Baden Benger, F.C.S., in the chair. There was a good attendance.

The Chairman, in opening the meeting, congratulated those present on being able to assemble in one of the lecture theatres of the college amongst so much that was interesting to pharmacists, and reminded them that they were indebted for this privilege to the Council of the Owens College, who were anxious to afford every facility to those who would avail themselves of the splendid opportunities for the study of materia medica and pharmacy now provided. He then called on Mr. W. Elborne to read his paper on—

Cinchona Barks.

BY WILLIAM ELBORNE,

Assistant Lecturer on Materia Medica and Pharmacy, Owens College.

The author, having described the important genus *Cinchona* botanically, stated that upwards of thirty-six species of *Cinchona* had been distinguished, but that only about a dozen furnished the barks of commerce. These were principally natives of the western mountainous regions of South America.

The chief varieties were enumerated as follows:—

		Their characteristic alkaloids.
I.	*C. officinalis,** var. *a. Condaminea*, *b. Bonplandiana*, *c. crispa* — yielding pale or crown bark	Quinine.
II.	*C. Calisaya,** yielding yellow bark	Quinine, Cinchonine.
III.	*C. Ledgeriana*, yielding Ledger bark	Quinine, Cinchonine.
IV.	*C. succirubra,** yielding red bark	Cinchonidine.
V.	*C. lancifolia,** yielding soft Colombian, Carthagena or Caquetta bark; *C. cordifolia*, yielding hard Colombian bark	Quinine.
VI.	*C. Pitayensis*, yielding Pitayo bark	Quinidine.
VII.	*C. nitida*, *C. micrantha*, *C. Peruviana* — yielding Huanuco, Lima or grey bark	Cinchonine.
VIII.	*Remijia pedunculata*, *Remijia Purdieana* — yielding Cuprea bark	Quinine, Quinidine, Cinchonine, Cinchonamine.

The methods of collecting bark in the native forests of South America having been described, the author traced the history of Cinchona cultivation in India, Jamaica and Ceylon, giving statistics of the areas under cultivation, etc. Of the countries where bark is cultivated Ceylon was, perhaps, the most important, although great efforts in the same direction were being made in Bolivia, Java, Jamaica and Southern India.

The manner of growth and the operations of collecting and harvesting the "cultivated barks," whereby the yield of alkaloids was greatly increased, were then alluded to. They comprised two different systems, viz., "mossing" and "coppicing."

The "mossing" system consisted in longitudinally stripping eight-year old trees of their bark at intervals of about two inches apart, winding moss all round and tying it on with fibre. At the end of six or twelve months the strips of bark left untouched at the first stripping were

* The official barks of the British Pharmacopœia.

removed, and the intervals they occupied were mossed. At the end of twenty-two months, on an average, the spaces occupied by the bark originally taken are found to be covered with renewed bark, much thicker than the natural bark of the same age, and this renewed bark can be removed and a fresh process of renewal again be fostered by moss. The enrichment of the renewed bark is said to be at the expense of the bark outside the mossed region, and also that the renewal is prevented or much retarded by the least injury to the cambium. The protection from light afforded by the moss has also been proved to increase the supply of alkaloids.

The "coppicing" system consists in cutting down the trees near the ground and allowing one or more of the young crops of the shoots which rise from the stumps to grow. The trees are barked at the proper season by coolies, to whom the felled stems and branches are made over as soon as they are cut. Provided with a stout knife, the coolie first marks the bark off into long narrow strips by putting his knife under it and pressing upwards. The end being freed, the remainder of the strip readily comes off; the bark is then laid to dry in sheds fitted with shelves.

The author next proceeded to describe the characteristic appearances of the above series of barks, drawing special attention to their "fracture." He stated that the manner in which the cinchona barks break transversely, or their fracture, depended upon their anatomical structure, and afforded an important criterion of the quality of the bark; the best characteristics by which barks containing much quinine might be distinguished were the *shortness* of the fibres which covered their transverse fracture and the facility with which they might be detached. Thus when dry *Calisaya* was handled a quantity of minute splinters ran into the skin causing much irritation; this forms one of its distinguishing marks. The following is a table of the official barks compared with the corresponding cultivated bark:—

	Barks of South American origin.		Cultivated barks (India, Ceylon, Jamaica, etc.		
	How found in commerce.	Remarks.	How found in commerce.	Remarks.	
C. Calisaya	Flat pieces	Trunk bark, outer layers removed, consists of *liber*, yellow colour, upper surface marked with digital furrows, under surface with long wavy fibres (thickness of hair). Fracture short, finely fibrous. Bark at present very scarce.	. . . .	Cultivation unsuccessful, consequently abandoned.	
	Quills	Bold, outer surface cracked at intervals of 1 inch, remains of lichens, short yellow fracture.			
C. officinalis	Quills only	Thin, slender, interspersed throughout with cracks and numerous lichens.	Quills only	In pieces less quilled than the South American, thicker, outer surface, perfectly clean (grown under moss), no lichens, inner surface of a light fawn colour. Jamaica variety black, very corky, no lichens (var. *crispa*).	Yield 6–8 per cent. total alkaloids. *C. succirubra*, best bark for pharmaceutical purposes.
C. succirubra	Flat pieces	Trunk bark, corky layers not removed. About 1 inch in thickness, very dull red colour, contains scarcely any alkaloid (having been converted into red colouring matter by prolonged action of light). Mostly exported to France.	Quills only	The very large quills taken from stems, red colour internally, remains of lichens. The smaller quills plump, red colour, clean outer surface, no lichens (mossed bark). Also in thin papery quills, purplish colour externally.	
	Quills	Large, red colour, remains of lichens.			
C. lancifolia	Flat pieces	Trunk bark, consists of liber with silvery remains of mesophlœum. Long fibrous fracture. This bark, together with flat pieces of *C. micrantha*, sold as flat Calisaya in commerce.		Not cultivated.	
	Quills	Very large, outer layers generally removed, yellow colour.			

The various processes for estimating cinchona barks were then described, the paper being illustrated throughout with specimens of barks and alkaloids from the Materia Medica Museum, Owens College.

After the reading of the paper a discussion ensued in which the Chairman and Mr. Hermann Woolley took part.

Mr. Elborne having replied, the Chairman, in moving a cordial vote of thanks to Mr. Elborne for his most interesting paper, said he would take that opportunity of expressing the pleasure he felt in seeing so many young

men present. During the sixteen years he had acted as Honorary Secretary of that Association lectures had been given and classes had been held with varying success. The tide of interest had ebbed and flowed; sometimes the classes had been very numerously attended and then there would come a dull and spiritless time. He hoped the present meeting augured well for the success of the pharmaceutical courses now being established in connection with the college, and that they were now entering on a period of something like enthusiasm. In glancing at the results of the educational efforts of the Manchester Association as a whole, he found many sources of satisfaction. A large number of students had derived valuable assistance in their studies, and some had become prominent men. Happily most of these were still living, and their modesty would be offended if he mentioned their names; but there was one, the late Dr. Carruthers, whose sad fate they all lamented, and whose memory they honoured. He remembered in the early days of the Association, a young apprentice from a country town came to him for the keys of the materia medica cabinet belonging to the Association, a very poor affair compared to the museum now open to students in the college, but still worth the young man's while to come a railway journey to see and work at. That apprentice was now a Doctor of Science of the London University, a recognized authority in chemistry, and, he was happy to add, still a pharmacist. There was probably not an apprentice in that room who could not do as much if he worked as hard, for it was by no royal road that this country apprentice had risen.

Mr. Robinson, of Pendleton, in a few appropriate remarks congratulated the meeting on the good attendance that evening, and had great pleasure in seconding the vote of thanks to Mr. Elborne for his admirable paper, which was carried with acclamation.

The Chairman then announced that two papers had been promised for the March meeting, but that February was still open. He nevertheless hoped one or more contributions would be received in due time.

The meeting then terminated.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The annual meeting of the above Association was held in their room, Church Institute, on Thursday evening, February 7. Mr. Martin, President, occupied the chair.

The Secretary (Mr. C. G. Wood) read the report of the year, which stated that the society was in a prosperous condition. There had been classes held each Tuesday evening on the subjects of Chemistry, Materia Medica, Pharmacy, etc.; these had been well attended. The classes are conducted under the superintendence of the President. A portion of study for preparation at home is given each week, and the practical portion of Chemistry is worked by the members themselves at the meetings. There have also been numerous papers read by several friends and by many of the members, the attendance at the meetings being highly satisfactory.

The Treasurer (Mr. Swinburn) was then called upon to give his financial statement, which showed that the Association was in a prosperous condition, as after all expenses had been paid there was a fair balance in hand. It ought to be stated here that the expenses are borne by the members themselves, with the exception of one donation from the Local Secretary of the Pharmaceutical Society.

The President then delivered his address.

After some preliminary remarks, he referred to the presence of a delegate from the Association at the last meeting of the British Pharmaceutical Conference, and then continued:—"But the mere fact of sending a delegate is not what we want; we want to profit by his attendance, we want to know how with our small ability we can help in the forward march of progress. Some people may be disposed to laugh at and ridicule this idea, but it is a square matter of fact idea nevertheless. Most of the subjects recommended for investigation are far above our attainments, but there are some which are quite in our province as willing students,—I mean such things as the best excipients for B.P. pills, the most satisfactory basis for ointments, or some such subject as the deposit in tr. quiniæ comp. In these cases we can all work together and, each taking one particular section of the subject, make himself master of that, and report his results to a general committee, who could tabulate the whole, and thus a quantity of useful information could be collected that doubtless would be of use to more advanced workers. There are other ways in which associations such as ours can be of service to the pharmaceutical body. For instance, the local papers which contain items, useful or interesting to chemists, might be sent to the trade journals, for they cannot be expected to hear of everything that occurs, and thus inquests, the cases of malicious or accidental poisoning, the doings of illegal traders, or of those of our own body who disgrace us would have the full benefit of publicity, a thing too often wanting, There is another point on which I should like to speak, and that is the future of the chemists of this country. I, for one, take no gloomy view of the situation; things are bad, I know, but I believe that we are in a state of evolution, and that the fittest will survive, and the weakest go to the wall. No doubt it is bad for the weak ones, but good for society at large. The name of chemist will be all the brighter and more respected when evolution has obliterated that dreary type of druggist, the huckstering rule of thumb man, whose highest aim in life was a cheap thing in hair oil or glue, who fixed his simple faith on mucilage or ext. gentian. as an excipient for pills, and who dispensed a mixture when he got one on the happy-go-lucky plan of dropping the ingredients into a bottle, filling up with water and letting them take their chance. The chemist of the future will be a chemist in more than name, an enlightened educated man, respected by the medical profession and cultivating new fields of enterprise brought to light through increased knowledge. And it is to this type we must try and attain, and it is for this reason that I throw in my lot with the Pharmaceutical Society, as I believe their efforts will bring about this desirable state of things. Many of you, I know, already subscribe to the Society, and I should be glad if the rest would do the same, for your help is useful, and in years to come, when you are in business for yourselves, the volumes of the Journal will prove a useful library for reference."

After the election of the following officers and revision of rules, the meeting terminated:—Mr. Martin, President; Mr. W. Buckley, Vice-President; Mr. C. G. Wood, Secretary; Mr. Swinburn, Treasurer. In each case the officer of last year was re-elected.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, February 7. Dr. W. H. Perkin, F.R.S., President, in the chair.

The President announced that a ballot for the election of Fellows would take place at the next meeting of the Society (February 21).

The following certificates were read for the first time:—Messrs. F. W. Brown, J. E. London, G. A. Parkinson, G. Tunbridge and T. U. Walton.

The Secretary then read a paper—

On the Expansion of Liquids, By D. Mendelejeff; translated from the Russian by B. Brauner.—Though every liquid has its own peculiar coefficient of expansion

a general expression for the expansion of all liquids has long been a desideratum. The generalization now given by the author is founded on the additional experimental material collected by chemists chiefly for the purpose of studying the specific volumes of liquids at their boiling temperatures. In the present paper only the physical side of the question is discussed. Most of the data are derived from Thorpe's paper (*Chem. Soc. Journ. Trans.*, 1880, p. 141). The uniformity in the expansion of liquids, shown by the examples given in numerous tables, may be represented by the formula—

$$V=\left(1+\frac{K}{n}t\right)^n$$

which is the same as that giving (according to Gay Lussac's law) the expansion of gases. For gases, $n=+1$; for liquids, $n=-1$. The expression for liquids becomes therefore $V=(1-Kt)^{-1}=\frac{1}{1-Kt}$, and as the specific gravities are inversely proportional, if D = density at t and Do the density at 0°, then $D=Do\,(1-Kt)$. The author then gives several examples of the close agreement obtained with the above formula and the experimental results of Thorpe. Thus with phosphorus tribromide according to Thorpe—

	t=40°	60°	80°	100°	120°	140°
V=	1·0348	1·0530	1·0720	1·0916	1·1123	1·1340
V calculated	1·0348	1·0531	1·0721	1·0918	1·1123	1·1325

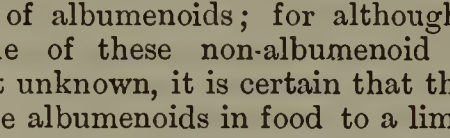
(K=0·000841). The author discusses the varying values of K in the exceptional case of water at different temperatures. The results of the paper may be summed up as follows:—In the expansion of liquids a peculiar regularity and a quantitative uniformity are observed, and the equation given above may be taken as an approximation to reality, K being a constant coefficient characterizing each liquid, as the specific gravity, the boiling point, etc. The author proposes to call K the determinator of expansion, and suggests that a determination of its value under different conditions is extremely important for the mechanics of liquids. The expression given above, although many liquids deviate slightly from it, is by itself sufficient in the majority of physico-chemical investigations, just as Gay Lussac's law is sufficient for most physico-chemical work with gases.

Dr. Morley said if the expression held with two liquids it ought to hold with mixtures. He examined some time back the expansion of hydrocarbons from petroleum and found that K first increased, then decreased; such a phenomenon could not be explained if the law was rigorously true.

Dr. Armstrong read an extract from a letter of Dr. Thorpe, who had seen the paper, in which he expressed his satisfaction that the physical data which he had been at some trouble to obtain should have formed the basis of such an important paper.

The President then called on Mr. R. MELDOLA to read a paper entitled—

Researches on Secondary and Tertiary Azo-Compounds. No. II.—The author describes in this paper, in continuation of his former researches, the action of diazotized paranitranilin upon tertiary monamines. In the case of dimethylanilin the resulting product is paranitrobenzenazodimethylanilin $NO_2C_6H_4N_2C_6H_4NMe_2$, and this on reduction by ammonium sulphide furnishes the corresponding amido compound. The amido group in the latter is easily diazotized and can be combined with phenols so as to form a new series of secondary azo compounds. Para-amidobenzenazodimethylanilin is a most delicate test for nitrous acid; when diazotized and then neutralized with ammonia a fine blue colour appears. By this test 1 part of sodium nitrite in 64,000 of water has been detected. The next portion of the paper deals with the action of diazotized metanitranilin upon primary, secondary and tertiary amines. The nitroazo compounds of the meta series could not be reduced by ammonium sulphide without complete decomposition, so that this method could not be applied for the preparation of secondary and tertiary azo compounds as in the para series. The β-naphthylamine compounds both of para- and meta-nitrodiazobenzene cannot be further diazotized by the action of nitrous acid, but furnish nitroso derivatives. From this fact the author concludes that an amido group is no longer present in these compounds, and assigns to them the constitutional formula—



A comparison of the melting points of the β-compounds both of the para and meta series also favours the view that they are differently constituted to the true nitroazo compounds derived from α-naphthylamin.

Dr. Armstrong thought the constitution suggested by the author highly probable; he had noticed with the naphthols the very marked difference between the α and β bodies.

Mr. Meldola, in answer to several questions, said that all the bodies were more or less coloured, but the more complex the body became the duller the colour seemed to be; there seemed to be a tendency to become bluer as the complexity increased. The difference between the α and β compounds seemed to depend on the fact that the most readily displaced hydrogen atom in the latter compounds was the contiguous ortho atom, so that we were really dealing with an ortho compound.

The Secretary then read a communication entitled—

Note on the Nitrogenous Matters in Grass and Ensilage from Grass. By E. KINCH.—The object of the author was to determine whether during the fermentations to which grass and other fodder crops are subjected in order to produce ensilage, the albumenoids undergo any change into other nitrogenous bodies not possessing the physiological functions of albumenoids; for although the exact nutritive value of these non-albumenoid nitrogenous bodies is as yet unknown, it is certain that they can only replace the true albumenoids in food to a limited extent. The sample of grass was taken during the filling of the silo, on July 17, 1883; the grass was coarse and contained notably thistles and *Ranunculi*; it was passed through a chaff-cutting machine. The weight on the silo was about 50 pounds per square foot. The ensilage was taken out on December 8. It was brown, scarcely acid, and had but little odour; it soon, however, developed a smell of acetic acid, which was subsequently replaced by that of butyric acid. It was readily eaten by cattle when mixed with dry fodder. The author gives detailed analyses of the grass and ensilage. The albumenoids were determined by the phenol, the copper hydrate, the mercuric hydrate and the lead hydrate methods. The most striking change was in the relative quantities of the albumenoids and non-albumenoids. In the grass the non-albumenoids formed but 9 per cent of the total nitrogen; in the ensilage the non-albumenoids had increased to 55 per cent. of the total nitrogen. So that during the fermentation in the silo nearly half the albumenoid nitrogen had been converted into non-albumenoid. Whether such changes in the nitrogenous matter always take place or, as is likely, are diminished in extent by increasing the pressure to which the fodder is subjected, and what nitrogenous bodies are produced, are questions which the author hopes to answer in a future paper.

Professor Church said that he had found it advantageous to add a little metaphosphoric acid, when employing his phenol process, if the material was at all alkaline.

Mr. Vincent mentioned some experiments in which cows had been fed alternately on ordinary food and on ensilage. The weight of the cows remained constant, but when fed on ensilage the cows furnished on an average two gallons of milk more per diem. He also could confirm the fact that ensilage from clover has a most powerful odour of butyric acid.

Mr. Warington said that it was hardly possible to overrate the practical importance of ensilage. As far as he knew, Professor Kinch had been the first to determine the relative quantities of albumenoid and non-albumenoid nitrogen in ensilage. There had been many analyses of grass and ensilage published, but no one yet had really made a quantitative experiment, *i.e.*, weighed all the grass which went in and the ensilage produced. We were also very much in want of analyses of foods as to the relative quantities of albumenoid and non-albumenoid nitrogen which they contained.

Mr. Friswell suggested that the experiment quoted as to the increase of quantity of the milk was of but little value unless the quality of the milk, as ascertained by analysis, was known.

Dr. Armstrong said it would have been interesting to know the quantity of nitrogen liberated by hypobromite.

Mr. Lloyd had endeavoured to investigate the form taken by the nitrogen, but had hitherto been unsuccessful. If too much pressure was used much nutritive juice was squeezed out of the grass. The great aim should be to avoid an acid fermentation.

The Secretary then read a paper on—

The Influence of the Temperature of Distillation on the Composition of Coal Gas. By L. T. Wright.—The author distilled a carefully mixed sample of Newcastle coal in a small iron retort; the charge was 2·24 lbs and the distillation occupied twenty-five to forty-five minutes. Four experiments were made at various temperatures; with the lowest temperature 8250 cubic feet of gas per ton of coal were obtained of 20·5 candle power; at the highest temperature 12,006 cubic feet, illuminating power 15·6. The gas in the first case contained 38·09 per cent. H, 8·72 per cent. CO, 42·72 per cent. CH_4; 7·55 per cent. other hydrocarbons and 2·92 per cent. N. The gas obtained at the highest temperature contained 48·02 per cent. H, 13·96 per cent. CO, 30·7 per cent. CH_4, 4·51 per cent. hydrocarbons, 2·81 per cent. N. The author discusses the influence of marsh gas, carbonic oxide, etc., on the illuminating power of the gas, and criticizes the experiments of Frankland and Thorne. In the second part of the paper the author gives some analyses of gas drawn from retorts at different stages of the ordinary process of gas manufacture. The results confirm those obtained by Dr. Henry.

Professor Foster said that apparently no analysis of the coal was given. He also gave an account of some experiments, which he had made, of passing steam over coke and thus liberating the nitrogen contained in it.

The Society then adjourned to February 21, when a ballot for the election of Fellows will be held.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the Chemists' Assistants' Association, held on Wednesday, January 30, Mr. C. Parkinson, President, in the chair, a paper was read on—

Turpentine.

BY F. HARRIS ALCOCK.

The introduction consisted of a general sketch of the Coniferæ and a description of the chief characteristics of that order, together with the numerous trees yielding turpentines. Special reference was made to the botanical sources, habitats, and characters of the pines which yielded the ordinary turpentine oleoresin. The methods of obtaining the oleoresin from the tree, both in the Landes department and in America, were fully described, and notes were read from various works bearing on the subject of extraction. The characters physical and chemical of the French and American turpentine were briefly described, and a complete description for obtaining the different oils from these sources was given, together with the mode of rectification, properties, composition, uses and adulterations of the oil. Of the last-named particular mention was made of the following, and the usual methods of detection enumerated:—Fixed oils, water, resin spirit or oil, undistilled turpentine, rosin, and petroleum spirit. With regard to petroleum spirit, mention was made of the recent correspondence and editorial jottings in the *Pharmaceutical Journal* on this subject. Dr. Armstrong's method for the detection of this adulterant, as was brought forward by him at a meeting of the Society of Chemical Industry, June 5, 1882, was fully explained, as also Mr. Boverton Redwood's suggestion with regard to the effect of this admixture on the flashing point test. A sample of turpentine oil examined by the author some time ago was found to be largely adulterated with petroleum spirit. Its presence was suspected because it was found that when used, mixed with paint, it caused severe illness to some individuals who happened to be in the house where it was being used. The sample had the odour and taste of turpentine oil and a specific gravity of ·8424. Ten c.c. evaporated over a water-bath were dissipated with the exception of 0·054 gram residue (of a light yellowish-green colour), in fifteen minutes. The liquid had a boiling point of 80° C. which gradually increased as the volatile portion distilled over, going towards the end of the process as high as 160° C. The residue in the retort was of an orange colour and resinous. Ten c.c. of the liquid distilled below 100° C. yielded about 3 grams weight of a colourless liquid which possessed only a faint smell of turpentine oil and was slightly fluorescent and had a smell which suggested petroleum spirit. By way of comparison several authenticated samples of oil of turpentine were obtained from different sources and subjected to the same treatment under the same conditions in order to satisfy the author that the oil of turpentine under examination was sophisticated, with the following result:—

	Quantity.	Sp. gr.	Residue.	Time to dissipate.	Boiling point.	Odour of distillate.	Remarks.
			Grm.	Min.			
A.	10 c.c.	0·8424	0·054	15	80° C. ending at 160°	Petroleum-like.	Adulterated samples.
B.	10 c.c.	0·8572	0·021	30	153·5° C.	Turpentine-like.	Re-rectified from KHO.
C.	10 c.c.	0·8807	0·328	63	158·° C.	,,	Old sample.
D.	10 c.c.	0·8746	0·048	45	155·° C.	,,	Ordinary sample.

The above data would enable one to pronounce unhesitatingly sample A as being impure, or, at least, what oil of turpentine should not be. If more of material were at hand the method to be adopted would be to obtain by fractionation what seemed to be "benzoline" or petroleum spirit and proceed with the distillate according to Dr. Armstrong's method.

In the discussion which followed, the President, Messrs. Braithwaite, Burnett and Millhouse took part.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association took place on Thursday, February 7, Mr. T. S. Dymond, Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed, a note was read on "The Crystallization of Phosphoric Acid," by Mr. P. L. Huskisson, which will be found printed on p. 644.

This paper was followed by a discussion in which the Chairman, Secretary, Messrs. Ince, Lowe and Short took part, and a vote of thanks was passed to Mr. Huskisson.

Mr. H. Allen, the Reporter on Physics, then made a report upon "Holtz's Electrical Machine and some of its Modifications." The report was illustrated by experiments and a number of machines of different forms were ex-

hibited, the most noteworthy among which were the Voss machine, which was lent by Messrs. Becker, of Covent Garden, and the Wimshurst machine, both of which were shown in working order. A discussion ensued, in which the Chairman, Secretary, Dr. Jackson and Mr. Lowe took part.

The meeting then adjourned.

SOCIETY OF ARTS

Recent Improvements in Photo-Mechanical Printing Methods.

The second of the course of Cantor Lectures upon this subject was delivered by Mr. Thomas Bolas on Monday the 4th inst. It was devoted specially to the various methods of preparing type blocks from line drawings and half-tone subjects and some experiments were made illustrating the formation of Woodburytype blocks by which the gradation of tone in a subject could be represented. A sheet of gelatine paper, coated with albumen and sensitized with bichromate of potash, was exposed behind a negative for some time to a strong light. The sheet was then taken away and a thin layer of a prepared ink placed upon it; afterwards, upon being soaked in warm water, the insoluble gelatine retained the ink, whilst the soluble portion was washed away. The transfer thus obtained consisted of a fatty relief, which left an imprint upon the stone or on the lead, afterwards to be prepared by treatment with acid for use as a type block. Some illustrations were handed round showing the difference between those of 1851 and 1883. Those illustrations of the earlier date, which the lecturer regarded as the commencement of a new era in regard to printing, consisted of a mere outline, simply showing the position and figure of the subject, whilst those of 1883 had less outline, but were rendered life like by the shadows and perfect gradation of tone. Reference was then made to a method employed for some time in Australia, by which a sheet of glass covered with a layer of wax was used as a transfer and hydrofluoric acid as the biting agent. In the course of the lecture, Mr. Bolas drew attention to the use of rollers, remarking that the leather roller employed for ordinary lithographic purposes was useless in the preparation of photo-lithographic prints, and recommending that velvet rollers should be used, as the fibres of the velvet remained separate; he also stated that he believed letterpress printers would soon begin to use indiarubber in preference to the composition rollers. In order to give the same sharpness of outline to a large number of copies, the lecturer considered it necessary to take a fresh transfer from the first block and use the second transfer to obtain the type-block. At the conclusion of the lecture, Mr. Bolas noticed the method used by Ives to obtain the type-block. If a thick sheet of metal, the surface of which is cut by fine groves into small pyramids, be pressed against an ordinary type-block, a perfect impression is obtained from the flattening of the points of the small pyramids; it is found best to insert a thin piece of paper between the two plates to avoid damage to the type-block. During the lecture, Mr. Bolas showed a number of photo-lithographs sent from all the principal printing firms, and endeavoured to point out the peculiarities which each expressed.

The third and last lecture of the series was delivered on Monday the 11th inst. Mr. Bolas commenced by describing a modification of Ive's process. A plaster cast of the photograph is taken, and upon the wet relief a thin layer of collodion is spread, to which a little gelatine is added to give more consistency. After a little while the film is stript off and a perfect transfer is thus obtained. Regretting that he had no time to speak upon the subject of chromophotolithography, the lecturer passed on to the cavity or intaglio process. Any method by which a fatty transfer is obtained can be used for the intaglio process, the only alteration necessary being that a reverse transfer is required. Though a much better style of prints can be obtained by this process, yet the expense of working is so much increased, that it can only be used when a higher class of work is required. A transfer is taken, and from this an imprint is pressed upon grained paper; this is laid down on a copper plate and etched; or sometimes a block of wood with prepared surface is used instead of the copper plate. Reference was then made to the graining, Mr. Bolas saying that Mr. Woodbury had produced grained photo-prints by mixing a gritty substance with the gelatine, though his productions were somewhat spoilt by the use of a lead instead of a copper plate to print from. Good results, however, have been obtained by the Waterhouse process; the peculiarity of this method is the scattering over the wet relief of a quantity of fine sand, coated with stearin or wax to prevent it sticking to the gelatine. Great advance had been made in the transfer of photo-prints in pottery. The plates for printing are made in the same manner as for ordinary lithograph or typograph work, but it is necessary that they should be more deeply marked, in order to allow a larger body of ink to remain upon the pottery. There are two ordinary methods in vogue for the transfer from the plate to the pottery; one is to take a transfer with a thick viscid ink upon thin tissue paper; the inked paper is then attached to the pottery, and after a time the paper is washed off with warm water, leaving the ink upon the pottery; according to the other method the transfer is effected by means of glue. A good transfer is obtained also by producing a design upon a bitumen plate with thick viscid ink; upon exposure, the uncovered bitumen becomes hardened, whilst a depression is formed by the subsequent removal of the inked portion.

Obituary.

JOHN HUTTON BALFOUR, M.D., F.R.S.

On Saturday last Scotland lost by death one of her most eminent scientific sons in Dr. John Hutton Balfour, Emeritus Professor of Botany in the University of Edinburgh. Professor Balfour was an Honorary Member of the Pharmaceutical Society of Great Britain, the North British Branch of which was indebted to him for many courtesies shown whilst he was Regius Keeper of the Botanic Gardens, and especially in liberally supplying the Board of Examiners with fresh and preserved botanical specimens for examination purposes.

John Hutton Balfour was born in Edinburgh in 1808. He was early sent to the High School and matriculated at the University when thirteen years of age. First at St. Andrew's University and afterwards in Edinburgh his studies seemed to show a bent for the church; afterwards, however, he inclined towards medicine. But according to a writer in the *Scotsman*, from whom we borrow some details, his ultimate career was largely influenced by a course of lectures on botany delivered by Professor Graham in the University of Edinburgh in the summer of 1826. Having completed his medical studies he passed the College of Surgeons in 1831, received the degree of M.D. in 1832 and became a Fellow of the College of Surgeons in 1833. After some infirmary work in Edinburgh he visited Paris, returning to his native city and settling down as a medical practitioner in 1834. Two years subsequently he helped in founding the Botanical Society, to which he contributed so many of his memoirs, and in 1838 he rendered a similar service to the Botanical Club. Already, in 1840, he was a successful "extramural" lecturer on botany, and, in 1841, upon Dr. (afterwards Sir William) Hooker being appointed Director of the Royal Gardens at Kew, Dr. Balfour succeeded him in the chair of botany in the University of Glasgow, which he filled for thirty-four years. In the same year he be-

came Regius Keeper of the Royal Botanic Gardens and Queen's Botanist in Scotland. Upon his retirement from the chair in 1879, Professor Balfour was succeeded by his second son, Isaac Bayley Balfour, who, only a few days since, was appointed to the Sherrardian Chair of Botany in the University of Oxford. The late Professor held several other offices and received many evidences from various bodies as to the high estimation in which he was held.

Professor Balfour was a somewhat prolific writer and several of his works, such as the 'Manual of Botany,' 'Elements of Botany,' and 'The Plants of the Bible,' are well known. Besides the larger works, he contributed a great number of memoirs on botanical subjects, several of which touched upon the domain of materia medica. Among these may be mentioned communications upon *Aconitum ferox, Narthex Assafœtida,* the Ordeal Bean of Calabar, *Atropa rhomboidea, Cephaelis Ipecacuanha,* etc.

SAMUEL FRANCIS ELLIMAN.

It is with deep regret we record the death, on the 25th ult., of Mr. S. F. Elliman, of Slough. Whilst riding across Englefield Common, in company with a friend, his horse suddenly bolted, and Mr. Elliman losing control over the animal was thrown and killed on the spot. Cut off in the prime of manhood, in the midst of a career of very varied usefulness, his loss will be keenly felt by a wide circle of friends both connected with, and outside pharmacy.

Mr. Elliman was apprenticed at the age of 17, to Mr. R. Griffith, pharmaceutical chemist, of Slough. At the expiration of his indentures in 1867, he sought experience in various pharmacies in Scarborough, Geneva and Paris. He was in the latter city during the greater part of the Franco-German war, only quitting it just in time to escape the horrors of the siege.

During the Session 1872–73, Mr. Elliman was a student in the School of Pharmacy, and in January of the latter year qualified himself as a Pharmaceutical Chemist. In the Laboratories, at Bloomsbury Square, he was deservedly popular, and few of his fellow-students will fail to recall his ardent love for physical phenomena, and the generous enthusiasm with which he was wont to describe to others the results of his own patient observation.

After spending some time at Nice and Florence, Mr. Elliman returned to Slough, and commenced taking an active part with his brother in the development of the business of Elliman, Sons and Co. In the intervals of business he found time to attend the lectures at the School of Mines, where he obtained a first-class certificate, and he spent some months in the physiological laboratories at South Kensington, under Professor Huxley, making himself practically acquainted with comparative anatomy. It was here he conceived the idea of illustrating anatomical subjects by means of stereoscopic photography. A few months' practice sufficed to enable him to master the most recent and approved photographic processes, and in the autumn of 1881 he proceeded to Lyons, where, by permission of Professor Chauveau, he was enabled to take photographs of the anatomical preparations used to illustrate the lectures at the Ecole Vétérinaire. On his return home he placed specimens of his work in the hands of Professor Flowers, who expressed his unbounded admiration of the conception and of the skill with which his idea had been carried out.

It was only a few hours before his death that Mr. Elliman was at the annual *soirée* of the Windsor and Eton Scientific Society, where holding in his hand a beautifully prepared skull, he explained to delighted groups of listeners, the marvellous construction of the human ear.

In his native town Mr. Elliman took a leading part in all movements calculated to promote the interests of education in its widest sense. He had provided, at his own expense, a gymnasium and swimming bath for the young men and boys of the neighbourhood, and was an energetic member of the Local Board and British School Committee.

Notice has also been received of the death of the following:—

On the 15th of November, 1883, at Melbourne, where he had gone in the hope of recovering his health, Mr. John Sydney Ashweek, Pharmaceutical Chemist, late of High Street, Gravesend.

On the 10th of December, 1883, Mr. John Andrews, Chemist and Druggist, Tarbolton, Ayrshire. Aged 57 years.

On the 9th of January, 1884, Mr. Charles Marshall, Pharmaceutical Chemist, London Road, Reigate. Aged 40 years.

On the 10th of January, Mr. George Alfred Lockwood, Chemist and Druggist, South Street, Moor, Sheffield. Aged 52 years.

On the 15th of January, Mr. William Walton, Pharmaceutical Chemist, City Road, Old Trafford, Manchester. Aged 42 years.

On the 16th of January, Mr. Herbert Joseph Abington, Chemist and Druggist, High Street, Ringstead. Aged 75 years. Mr. Abington had been a Member of the Pharmaceutical Society since 1873.

On the 20th of January, Mr. James C. Larkworthy, Chemist and Druggist, Spring Grove, Isleworth. Aged 82 years.

On the 20th of January, Mr. Richard Reckerby Sheppard, Chemist and Druggist, South Road, Sheffield. Aged 57 years. Mr. Sheppard became a Member of the Pharmaceutical Society in 1882.

On the 21st of January, Mr. John Brown, Chemist and Druggist, Eccles, Lancs. Aged 62 years.

On the 21st of January, Mr. Albert Hounsell Biggs, Chemist and Druggist, Pimlico Road, S.W. Aged 46 years.

On the 25th of January, Mr. George Hayward, Chemist and Druggist, Croydon. Aged 36 years. Mr. Hayward had been an Associate of the Pharmaceutical Society since 1870.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Pharmaceutical Society.

Sir,—I hardly like to confess it, but I am beginning to be a little bit ashamed of owning any connection with such a milk and water affair as the Pharmaceutical Society is getting to be. I have been asked sometimes what good has the Society done for the chemists and druggists, and upon my word I have found it difficult to reply, but it seems to me the answer will soon be easy enough and short,—"None."

There is a great talk about the advancement of pharmacy and the benefit of the public; but when the interests of the trade or the privileges of its members are concerned, or putting in force the Sale of Poisons Act against illegal traders in a large way, why then we do not hear quite so much.

If a twopenny-halfpenny shopkeeper sells a few pennyworths of precipitate, or a poor beggar with a wife and three or four children, struggling for a living and trying his hardest to pass his exam., keeps a shop to enable him to exist in the meantime, he gets a letter from the Society's lawyer with a demand on him for £5. But if a man in a big shop sells cyanide of potassium by the pound to all comers he is not interfered with; or if one of the stores sells chloroform without a poison label, we are told that being

a "limited company" they are outside the provisions of the Act," and consequently no action is taken in either case, simply because the parties can fight. Or if a coroner acts in an insulting and threatening manner towards a pharmacist,—instead of taking it up and telling the man that the Society will stand by him and defend his rights, the lawyer points out to the coroner the clause giving exemption, and we have a sort of thankful note in the Journal "that there is reason to hope that the threatened contingency will not arise," with a kind of half-apology for our claiming exemption at all.

I am altogether disgusted that the Council do not speak out firmly on this and other subjects; if they did so they would be much more likely to have the support of the trade, and to be respected by the outside public, both official and non-official, and to be listened to with attention, both in the matter of the Pharmacopœia and the Pharmacy Act amendment, than they are now when they go cap in hand to the Government and the doctors, asking as a favour what they ought to demand as a right.

I do not suppose you will print this in the Journal, I only wish you would, for I know many would agree with me.

Cheetham Hill. W. Wilkinson.

[*** The strength of a chain is measured by its weakest link, and the foregoing letter may serve to illustrate one of the influences which tend to minimize the efficiency of the Pharmaceutical Society as a representative body. We publish it, however, less for the sake of obliging the writer than because we are convinced he would not in his present state of mind regard its suppression as a kindness.—Ed. Ph. Journ.]

The Supply of Prussic Acid.

Sir,—In the *Pharmaceutical Journal* of February 2, "N. B." finds fault with chemists for selling prussic acid to customers other than medical men. I do not agree with his views. Hundreds of drugs that are in daily demand are poisonous, and if a person contemplating suicide can not procure prussic acid, it is perfectly easy for him to get other poisons, such as laudanum, chlorodyne, strychnine, vermin killers, oxalic acid, carbolic acid, vitriol, etc., which are the drugs more usually resorted to for committing suicide. Of course we can caution purchasers as to their poisonous nature; but if they insist on having them, and that for likely purposes, and promise to use them with caution, we cannot refuse to supply them. "N. B." might as well argue that cutlers should not sell razors or knives lest they be used for murderous purposes, or even ropes, for many have followed the example of Judas and hanged themselves with halters.

Further, prussic acid is frequently used for toilet purposes. If we refer to the query columns of ladies' journals we find that it is often recommended for whitening or bleaching the skin; cyanide of potassium is also mentioned for the same purpose. Prussic acid is often required for poisoning dogs, cats, and other animals. I have sold many a half ounce of it for this purpose.

Samuel Lawrence.

Sir,—The repeated cases of poisoning through carelessness on the part of chemists and druggists in the supply of poisons to the public especially such articles as "prussic acid," induces me to ask you to add my letter to that of "N. B.," as a protest against its sale.

We all know that it is quite legal for any registered person to sell the article in question, provided the necessary signatures are obtained; but, nevertheless, it does seem to me a most unwise (I may say penny wise and pound foolish) policy to supply it to any other person than a medical man, even for the purpose of poisoning dogs.

A case under my notice will illustrate the danger fully. A few days since, a gentleman, entirely unconnected with the trade or medical profession, told me that he had in his possession an ounce bottle filled with Scheele's acid, describing it accurately to me, which he had procured from a druggist, two months ago, for the express purpose of *then* destroying his cat. It is needless to say, the cat is still alive and the poison ready at hand "if required for an insane purpose."

In my apprenticeship, I was taught never to sell the article, but to offer to poison the animal myself, if animal it was required for. I always considered this a very wise policy, and certainly it brings just as much remuneration, if not more. If all druggists would adopt this simple practice we should hear of many less cases of poisoning by prussic acid.

Mr. Morris, of Lowesmoor, could have hardly thought much of what he was doing, when he sold the fatal acid to his customer for the purpose of "cleaning clothes." The poor excuse for its purchase ought to have been apparent at once! I must repeat "N. B.'s" words—"Signing the poisons sale-book will not prevent suicide."

The supply of prussic acid to the public is, therefore, extremely injudicious. Its use is principally for the purpose of taking life, and if druggists allow its sale so readily, Government should interfere and prohibit its sale entirely, for the sake of the community.

228, *South Lambeth Road.* A. E. Bertie Smith.

The Preliminary Examination.

Sir,—I looked with some curiosity for the result of the new arrangement for the Preliminary examination, and was, I must confess, considerably surprised to see Mr. Hodgson's note expressing satisfaction with the result. It may be satisfactory to the examiner, but I doubt whether the candidates themselves share the feeling. On referring to the Journals of last year I find an average of $13\frac{1}{2}$ questions set at each exam., *i.e.*, Latin, $4\frac{1}{4}$, Arithmetic, 5, English, $4\frac{1}{4}$; but last month, under the new rule, 19 questions were set, of these 5 were Latin, 7 Arithmetic, 7 English.

Last year an average of $50\frac{1}{7}$ passed, and $49\frac{6}{7}$ failed. Last month $45\frac{2}{3}$ passed and $54\frac{1}{3}$ failed. Now, although the candidates were allowed an extra hour and half they had $5\frac{1}{2}$ more questions to answer, and of these two were in arithmetic, the subject that has always caused most failures.

I was under the impression that the extension of time was solely to prevent the candidates being hurried, but the above data would point to raising the standard for the Preliminary exam.

I trouble you with this note in order to point out to intending candidates that they must look out for extra work as well as extra time.

L. S.

"*Student.*"—(1) Beale's 'How to Work with the Microscope' (Harrisons) or Carpenter's 'The Microscope' (Churchills). (2) An acquaintance with the language is required, not with any special book. (3) The preparation to which you refer is now so well known by the name commonly applied to it, that the use of the name, though incorrect, is to a certain extent justifiable. With those who object to the misnomer it is a common practice to attach to it a qualifying indication. (4) Yes, for the present.

J. R. Hill.—Copies of the Return may be obtained from Messrs. Hansard, Great Queen Street, London, W.C.

"*Doubtful*" is referred to the rule as to anonymous correspondents and to a Latin grammar.

"*Minor*" is recommended to consult the advertisement pages, as we cannot undertake to recommend particular tradesmen.

H. C.—The answer would depend upon the composition of the ink, of which you say nothing.

E. V. Z.—Probably indigo would be the best dyeing material. See the article on Dyeing in Ure's 'Dictionary' or Crace-Calvert's work on the subject.

"*Student*" (Christchurch).—(1) Dissolve the hyd. perchlor. in the spirit, add the ether and then the boracic acid in fine powder. Solution will not take place, so the bottle must be shaken before use. (2) Use carbolic acid in crystals. If the mass be dry, use as an excipient glycerine of tragacanth; if moist, powdered tragacanth. (3) Dissolve the phosphorus in benzol; powder the strychnine with the ferrum redact., and add the zinc. valer. As an excipient use glycerine of tragacanth. (4) Dissolve the salicin in a little aq. chloroformi; powder the quinine and add a little mucilage to suspend it, and mix with the other ingredients.

Communications, Letters, etc., have been received from Messrs. T. and H. Smith, Bowie, Combs, Wilkinson, Newsholme, Nicholson.

SPECIAL ISSUE OF THE

Pharmaceutical Journal

On Saturday next, February 23.

A COPY WILL THEN BE SENT TO

EVERY CHEMIST AND DRUGGIST

Whose Name appears on the Register, whether residing

AT HOME OR ABROAD.

CIRCULATION **16,000** COPIES.

Terms for Advertisements in this Special Issue:—Whole Page, £5; Half Page or Whole Column, £2 10s.; Quarter Page or Half Column, £1 5s.; Eighth Page or Quarter Column, 12s. 6d. Orders given for a Series of insertions will secure the benefit of the large issue at the usual reduced rates.

Advertisements for the Special Issue should be sent by or before Tuesday next, to the Publishers,

J. & A. CHURCHILL, 11, New Burlington St., London, W.

N.B.—An Index to the Advertisements, for the purpose of facilitating reference, will be given.

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HOMŒOPATHIC PHARMACIES

9, VERE ST. W. & 5, ST. PAUL'S CHURCHYARD, E.C. LONDON.

DIMENSIONS—
Length, 20 in.; Breadth, 15¾ in.;
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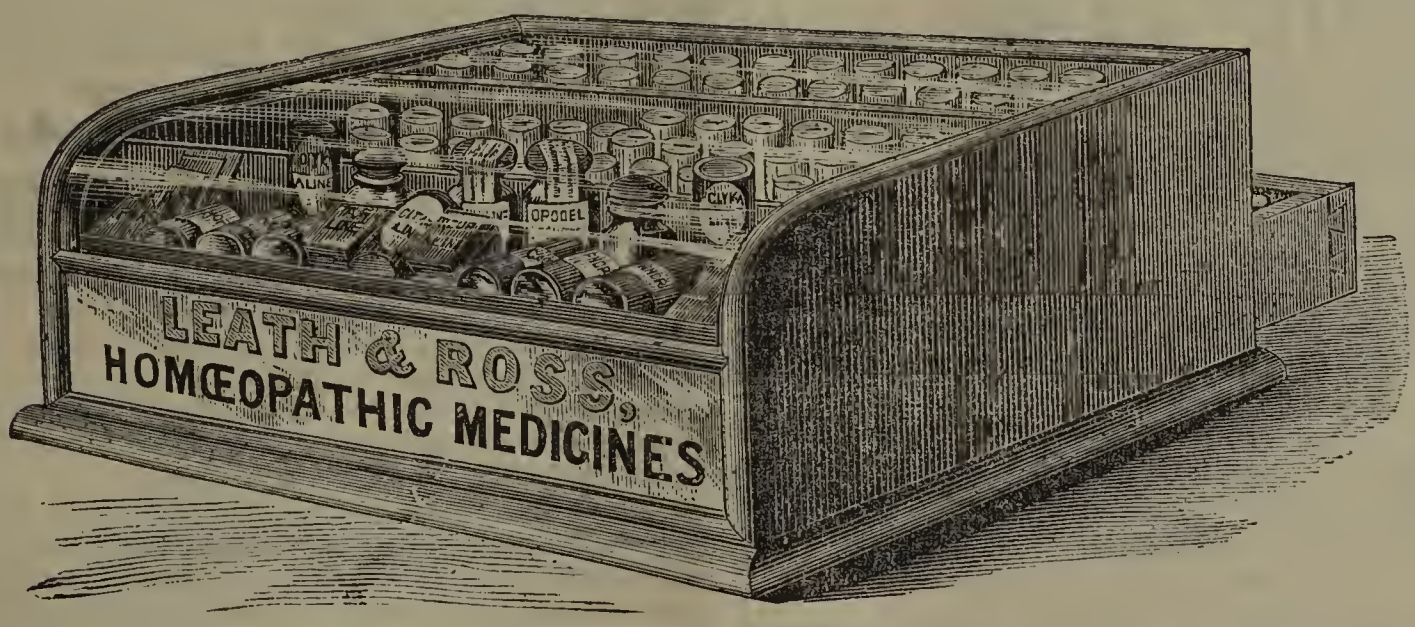


Price £6 6s., contents realize £10 18s. 3d.
Cash Discount 10 per cent.

For further particulars, see our Illustrated Price Current, sent by Post on receipt of Business Card.

Leath & Ross's Wholesale Price List of Medicines, &c.

PUT UP READY FOR SALE.

GLOBULES—Sixpenny Tubes, 3/- per doz
Ninepenny „ 4/6 „
Shilling „ 6/- „

PILULES and TINCTURES: Sixpenny Bottles, 3/- per doz.
Ninepenny „ 4/6 „
Shilling „ 6/- „

Buyers of Varnishes, Oils, Paints, and Colours, &c.

To ensure buying on best terms, should consult the

OIL AND COLOURMAN'S JOURNAL

OFFICES: 19, LUDGATE HILL, LONDON, E.C.

Specimen Copy 8*d.*, post free. Subscription 7*s.* 6*d.* per annum, including Diary.

SUGAR COATED PILLS

R. HAMPSON prepares the Pills of the Pharmacopœia, and a great variety of Pills from useful formulæ. The Pills are made of the best ingredients, and being *quickly* diffusible always give satisfaction. A Price Current and sample post free. Supplied direct or through the Wholesale Houses. Special quotations for large quantities.

205, ST. JOHN STREET ROAD, E.C.

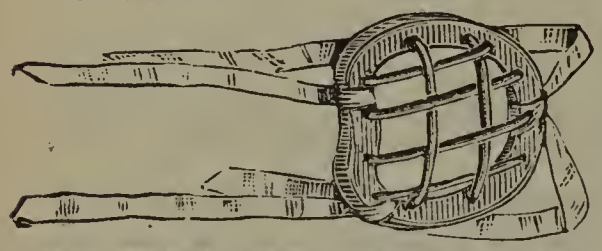
ORANGE WINE, MANUFACTURED SPECIALLY FOR QUININE.

THE great advantage of this wine over ordinary orange wine is that it does not throw down any deposit, and will remain perfectly bright after adding quinine. Price 4*s.* 6d. per gall. net. A sample will be sent post free on application, enclosing trade card. Address,

W. WOODHAMS, British Wine Manufacturer, Peckham.

ASK FOR

COWAN'S VACCINATION SHIELDS



As inferior articles are in the Market. From all Wholesale Houses. WILLIAM COWAN, Inventor and Maker of the Vaccination Shield 51, Stanhope St., Glasgow.

FRED^K FINK & CO.

10 & 11, MINCING LANE, LONDON, E.C.

SPECIALITIES: Glycerine—Gum Arabic—Gum Tragacanth—Pure Beeswax—Gelatine—Glucose

SUCCUS TARAXACI

FROM THE FRESH AUTUMNAL ROOT.

Prepared by a special process in which the flavour is preserved and the bitter principle retained; the product being bright and clear, with all the medicinal qualities of the fresh root unimpaired.

1/10 per lb., C. Qts. 1/8, W. Qts. 1/6.

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RIMMEL'S AROMATIC OZONIZER, a fragrant powder emitting the cool and healthy breezes of the Pine and Eucalyptus, to purify the air in bed rooms, sick rooms, &c., 1s. Aromatic Pocket Cassolette, to preserve from infection, 6d. Sold by all Chemists.

Wholesale of E. RIMMEL, Perfumer, 96, Strand, London.

PETROLEUM JELLY,

EQUAL TO AND CHEAPER THAN VASELINE.

SANITARY FLUID AND SHEEP DIP,

THE CHEAPEST AND BEST DISINFECTANT.

Grease, Pitch, Asphalte, and all products of Tar and Rosin.

Samples and Prices on application.

GRINDLEY & CO. POPLAR, LONDON, E.

Chemists' Tea Agency.

WALKER & DALRYMPLE'S

BROKEN-LEAF TEA, 1s. 8d. per lb.

A MONEY SAVING TEA. ABSOLUTELY PURE.

The small leaf from some of the finest India and China Teas. Produces a tea in the cup stronger, richer, and cheaper than most whole-leaf teas. Agents appointed, where unrepresented, throughout the United Kingdom.

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INTERMEDIATE TEA, 2s. per lb.

BEST at the PRICE EVER SOLD. Great strength, and a most useful tea where there is a large consumption. Recommended to all who wish to SAVE in their tea. Agents appointed, where unrepresented, throughout the United Kingdom.

WALKER & DALRYMPLE'S TEAS.—

AGENTS APPOINTED, where unrepresented, throughout the United Kingdom.

Prospectus and samples free on application.

Warehouses, 154, 155, 159 and 160, Whitechapel Road, and Brady Street, London.

P.O.O. payable at head office. Bankers, the National Provincial Bank of England.

PULVIS JACOBI VERUS,

PREPARED BY

W. Hooper

HAS an acknowledged reputation as an Antimonial, and its value and efficacy is verified by a continued and increasing sale in the Indian Empire. Sold in 1 and 4 oz. Bottles (Troy), at 2/9 and 10/6, also in Packets for transmission by Post. W. HOOPER & CO., 24, Russell Street, Covent Garden.

METHYLATED SPIRIT & FINISH

LICENSED MAKERS

A. & J. WARREN,

WHOLESALE DRUGGISTS,

23 & 24, REDCLIFF STREET, BRISTOL,

Who offer the same in tins and casks, and can supply best Rectified Spirits of Wine in quantities of two gallons and upwards.

APRIL,

JUNE AND JULY MINORS

MR. JUDD'S Daily Class will commence March 3rd. Students can depend upon every effort to secure success. Extra advantages for resident pupils. At the last exam. three passed out of four.

Evening Classes for the same exams. are held every Thursday and Friday evening. No time should be lost, as a new Syllabus is being commenced.

Tuesday and Wednesday evenings as usual for beginners. Write with stamp, or call before 7.30 upon Mr. H. JUDD, W.C.S.O.P., 31, Regent Square, W.C.

CONCILIO ET LABORE.

The Manchester College of Pharmacy

225, OXFORD STREET, MANCHESTER.

MR. W. S. TURNER finding his own time too full to allow him to take Preliminary Students has arranged for a Visiting Master to conduct a class for that exam.

Full particulars of all classes on application. See advertisement of Feb. 2nd and of Feb. 23rd.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY.

Laboratory and School Buildings:

173 MARYLEBONE ROAD, N.W.

The next course of lectures for the April and June Examinations will commence on MONDAY, FEBRUARY 25, the fee to the April Examination being 6 guineas, to June 10 guineas, or to July 12 guineas. Intending students are asked to enter their names early, in order that benches may be reserved for them.

For Prospectus, apply to

Messrs. LUFF & WOODLAND.

"SYSTEMA OMNIA VINCIT."

SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing April 15th.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS

(*From the Royal School of Mines*),

6, ROCHESTER SQUARE, CAMDEN ROAD, N.W.

As each Student is taught and works *separately*, entry may be made at any time. Individual personal attention. No Demonstrators. Postal teaching. Enclose stamp for terms, &c.

LABORATORY CLOSE TO GOWER STREET STATION.

FOUND 54 Rats found dead by one dressing of SANFORD'S RAT POISON. *Vide* Testimonial from F. FOWLER, Farmer, Henlow, Bedfordshire.

Save your Corn Stacks, &c., by using

SANFORD'S MICE POISON,

which has given entire satisfaction for the past 27 Years.

Testimonials constantly coming to hand.

Price 6d., 1/-, 3/-, of all Chemists; or from

SANFORD & SON, SANDY, BEDS.

Price to Chemist, 7s. per dozen, *ON SALE OR RETURN.* **DEAD**

WESTMINSTER COLLEGE

TRINITY SQUARE, LONDON, S.E.

MICROSCOPICAL and CHEMICAL ANALYSES for the Trade.

The next Course of Lectures and Classes for Minor Students will commence on Monday, February 25th.

FEES—MINOR OR MAJOR.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

April Exam.	... £5 5s.	June	... £8 8s.
6 Months	...£10 10s.	12 Months	£15 15s.

Students intending to enter on the above date are requested to send in their names as early as possible, so that benches may be reserved for them.

A completely fitted Dispensary is attached to the College for the benefit of those students who require instruction in this department.

BOARD AND APARTMENTS FOR STUDENTS.

In order to secure the comfort of Students during their stay in College, Mr. Wills (Principal) provides a limited number of Students with comfortable and conveniently situated Apartments: Such Students meet for meals at Mr. Wills' Private Residence, Gladstone House, St. George's Road, Southwark.

Terms, Four Guineas per Month.

There will only be four vacancies in Mr. Wills' House for Resident Students after the February examination. Early application is required.

For Prospectuses and other information, apply to

Messrs. WILLS & WOOTTON.

STUDENTS' AIDS TO EXAMINATION.

PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, Gratis. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

THE UNIVERSAL
Postal System of Instruction

Has been established for the express purpose of preparing for the various examinations of the Pharmaceutical Society students residing in the country, or those unable to attend a School of Pharmacy.

Pharmaceutical Preliminary	**Fee**	**10s. 6d.**
Pharmaceutical Minor	**Fee £1**	**1s. 0d.**
Pharmaceutical Major	**Fee £1**	**1s. 0d.**
Medical Preliminary	**Fee £1**	**1s. 0d.**

TESTIMONIALS.

PRELIMINARY POSTAL LECTURES.

63, GREY FRIARS, STAFFORD,
February 6th, 1884.

DEAR SIRS,

It is with great pleasure that I have to inform you that I was successful at the Preliminary exam., January last, and I am sure I owe the whole of my success to your Postal System.

Yours truly,
H. E. S.

MINOR DIVISION.

LUCERNE COTTAGE, HURSTPIERPOINT,
15*th July*, 1883.

DEAR SIRS,

I am pleased to tell you I passed the Minor on Friday last; got through very well indeed. Your valuable works, "Elements of Pharmacy," "Materia Medica," &c., have been of great assistance to me; also I have derived great help from your admirable Postal Lectures, and have great pleasure in bearing testimony to their efficacy, and shall recommend it to anyone who is unable to go to London to study. With your "Handbook to Analysis," and perseverance in practical work, Chemistry, the most difficult subject, is mastered.

Yours very truly,
A. W. H.

MAJOR DIVISION.

1, EASY ROW, BIRMINGHAM,
30*th October*, 1882.

GENTLEMEN,

I sincerely thank you for your congratulations on passing the Major examination. I did very well, especially as it was my first time up.

I derived material benefit from your Postal System, chiefly because it defines to a great extent the limits of the work, and also on account of the concise and thorough manner in which the lectures are written. If anyone thinks that the system is a cram, they could not err more grievously.

I should like to make one remark upon your Materia Medica, taken together with your lectures on the subject, it is a perfect specimen of what can be done in a very limited space, by an author who is well up in his subject and possesses the art of teaching to perfection.

Wishing your establishment a continuation of that success which it has now obtained,

I am, &c.,
J. W.

The originals of these and numerous other Testimonials may be seen at the Office.

For full particulars apply to Messrs. WILLS & WOOTTON, Trinity Square, London, S.E.

PHARMACEUTICAL PRELIMINARY,

LONDON Matriculation, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Postal tuition for these examinations and Bell Scholarship. For particulars, enclose stamp, Mr. DAWES, 1st B.A. Lond. (late of Burton Cres.), Adderstone, Vardens Rd., New Wandsworth, S.W. (close to Clapham Junction Station).

PRELIMINARY EXAM. NO PASS, NO PAY.

STUDENTS who really desire to be thoroughly and carefully prepared, so as to ENSURE SUCCESS, should study under the **NO PASS, NO PAY, POSTAL SYSTEM.** For particulars enclose stamped envelope to TUTOR, care of Mr. Filtness, Rotherfield. Reference to pupils who passed the last examination.

ENGAGEMENTS WANTED.

AS TURNOVER, in a good Dispensing business, with time for study. Passed Preliminary. Will give services for board, &c. FREDK. ELLIS, Chemist, Topsham, Devon.

AS JUNIOR. London or seaside. Age 20. 5 years' experience in Retail and Dispensing. Height 5ft. 7in. Satisfactory references. J. E. BURY, Sutton Brailes, Shipston-on-Stour.

AS JUNIOR, in good Dispensing house (London preferred) or in the Wholesale department. Height 5ft. 9in. Age 20. 4 years' experience in good Dispensing business. T. T., Market Pl., Somerton, Somerset.

IMMEDIATELY.—As Junior ASSISTANT, in a Retail and Dispensing business, in or near London. Excellent references. Age 20. Height 5ft. 11in. Nearly 5 years' experience. C. R. J., Messrs. Clarke & Hornby, George St., Richmond, Surrey.

BY a thorough man of business, as SENIOR or MANAGER. Age 27. Height 5ft. 7½in. Sober, energetic and competent. 11 years' good experience (3 in London). Good references. CIVIS, 91, Harrow Rd., W.

ADVERTISER, preparing for Minor, age 20¾, seeks evening employment in London. Possesses first-class certificates and Queen's prizes in Advanced Analytical and Theoretical Chemistries (Organic and Inorganic), Botany, Physics. Highest references. W. A. JONES, N. S. Infirmary, Stoke-on-Trent.

WHOLESALE.—As ASSISTANT. 9 years in Retail, also little Wholesale. Country preferred. T. S., 2, Highland Vale, Worrell Rd., Clifton, Bristol.

AS ASSISTANT, at once. In London preferred. 9 years' experience. Age 24. CHEMIST, 32, Holland St., S.E.

RE-ENGAGEMENT as MANAGER. Married. No family. 20 years' London and provincial experience. Competent Dispenser and Prescriber. Qualified by exam. Permanency. A. P. S., 33, South St., Dorking, Surrey.

EARLY in March.—As ASSISTANT in London, with opportunities for attending evening classes. Age 24. First-class London and provincial experience. State full particulars. W. G. W., 1, Harold Pl., Hastings.

EVENING engagement from 6 p.m. daily. Terms moderate. B., Surrey Dispensary, Great Dover St., Boro'.

AS Temporary MANAGER or ASSISTANT. Many years' experience in London and country. First-class references. Disengaged. CHEMIST, Milton Villa, Shaftesbury Rd. East, Hammersmith.

AS SENIOR or MANAGER. First-class provincial and West-end experience. Of gentlemanly appearance and address. Permanency desired. CHEMIST, 146, Clifton St., Cardiff.

AS ASSISTANT, either in or out-door. Thoroughly competent. Satisfactory reference. Height 6ft. Age 28. Disengaged. STATIM, 127, Buckingham Palace Rd., S.W.

ENGAGEMENTS WANTED.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. Town and country experience, and for references a list of more than 50 former clients forwarded on application.

AS ASSISTANT. 12 years' experience. Height 5ft. 7in. Accustomed to a good class trade (light Retail and Dispensing). Town or country. H., Mr. Fred Baker, Fern Cottages, Kidderminster.

JUNIOR. Disengaged Feb. 27th. In or out-doors. Accustomed to good class business. Well up in Dispensing and general Retail. Good references. E. J. S., 22, Henrietta St., Bath.

AS LOCUM TENENS or MANAGER of a Branch, by a Pharmaceutical Chemist and Registered Dentist, with good experience and highest references. BETA, 1, Catherina Villas, Alexandra Rd., Windsor.

AS JUNIOR. In or near London. Age 23. Height 5ft. 6in. 7 years' experience. CHEMICUS, Rock Ville, Manordilo, Carmarthenshire.

AS ASSISTANT or DISPENSER, with time for preparing for Minor examination. Age 31. L. HASSALL, 71, Charles St., Hanley, Staffs.

AS MANAGER, for Dispensing and Prescribing business, with view to succession. Minor qualification. 22 years' experience in good business. Married. Highest references. S., 225, Gt. Cheetham St., Manchester.

AS JUNIOR, in light Retail and Dispensing business, in London or suburbs. With time for study preferred. Age 20. Height 5ft. 8in. Good reference. Disengaged. TYLER, Walton, Ipswich.

AS JUNIOR, in town. 4 years' experience. Age 21. Height 5ft. 9in. Salary not so much an object as to enter a good house. D., 26, Mildmay Grove, Mildmay Pk., N.

WITH Surgeon, in London, as DISPENSER, with time allowed for study in exchange for part salary and board. Age 21. Z. FLETCHER, 12, Rendezvous St., Folkestone.

AS ASSISTANT, temporary or permanent. Varied experience. Can Prescribe, Extract Teeth. Age 30. Good references. Strict abstainer. Terms moderate. AQUA, 23, Cardiff St., Rochdale Rd., Manchester.

AS ASSISTANT, in mixed trade. Good experience. Out-door preferred. NIMROD, 172, Bramall Lane, Sheffield.

AS JUNIOR. Early in March. In good Family and Dispensing business. Large country town preferred. Age 20. Height 5ft. 7in. F. ORANGE, 28, Hudson Rd., Southsea.

WHOLESALE or Retail.—As ASSISTANT. Energetic and industrious. Age 24. Height 5ft. 10in. Photo. Out-door. E. S., 25, Wolseley Rd., Bishopston, Bristol.

AS ASSISTANT, in London. Accustomed to Retail and Dispensing at fashionable watering place. Age 22. 6 years' experience. Two nights weekly required for study. WHELDON, South Parade, Northallerton.

AS JUNIOR or IMPROVER. London or suburbs. 3½ years' experience. Age 19. Well up in Dispensing. Disengaged on the 26th. J. H. EVANS, Market Pl., Stowmarket, Suffolk.

AS ASSISTANT, in light Retail and Dispensing, or DISPENSER at Hospital. 7 years' experience. Age 23. Height 5ft. 11in. E. MARSHALL, Grange Villa, Fulford Rd., York.

AS ASSISTANT or SENIOR (Minor qualification) in good Dispensing and Retail trade. Age 24. Height 5ft. 9in. Abstainer. Disengaged Feb. 27. Good reference. J. ARTHUR, 52, Boro, Farnham, Surrey.

ASSISTANTS WANTED.

AT once.—In a London suburb. A competent ASSISTANT, about 22, accustomed to good Dispensing. Apply, with full particulars (and photo., if personal interview not convenient), to L. W., care of Messrs. Flood & Co., 101, Blackman St., Boro', London, S.E.

IMMEDIATELY. — A competent ASSISTANT, indoors. One able to Extract Teeth preferred. Salary according to ability. Apply to J. BEEDZLER & Co., 18, Norton Folgate, E.C.

A QUALIFIED ASSISTANT, about 25 years of age, unmarried, with good address and energy, and first-class references, to conduct, under supervision, a good suburban business. Purchase of business by yearly instalments or otherwise would be entertained. Apply personally to 4, Collyer Ter., Gipsy Rd., Gipsy Hill, S.E.

AN ASSISTANT, for the Mixed trade. In-doors. No Sunday duty. Member of a Christian Church and total abstainer preferred. Must be able to Prescribe and Extract Teeth. Address, giving references from two last situations, to J. WATTS, Chemist, Attercliffe, Sheffield.

A GOOD Junior ASSISTANT, with some experience in Dispensing. Apply personally, after 10.30 a.m., or by letter, enclosing carte (to be returned), to W. HICKMAN, Archer St., Notting Hill, W.

A STEADY, trustworthy ASSISTANT, about 21, having fair knowledge of Dispensing and Prescribing, in a select light London Retail, or one requiring time for study. Address, with references, experience and salary, to BETA, Sanger & Sons, 489, Oxford St., W.

RADCLIFFE Infirmary, Oxford.—A DISPENSER for in and out patients. Non-resident. Salary £100. He must be registered under the Pharmacy Act, and be prepared, if elected, to enter upon his duties on March 8. Testimonials, with particulars of age and previous experience, to be sent to the Secretary not later than February 27.

By order. J. HODGKINS, Secretary.

COMPETENT ASSISTANT, who has had good experience in Dispensing. Must be qualified. Apply, stating usual particulars, to Messrs. SHARPE & SON, 34, High St., Notting Hill, London, W.

AT once.—A Junior ASSISTANT, accustomed to good class business. State age, height, salary required, and enclose photograph, to PAYNE & ADAMS, Shrewsbury.

IMMEDIATELY.—Out-door. A Junior ASSISTANT, for a Mixed country business. Must have a fair knowledge of Dispensing. Time for study if desired. Apply, with full particulars, to J. W. BRAYNE, New Mills, near Stockport.

IMMEDIATELY.—An ASSISTANT, accustomed to a Mixed country trade. Must be a quick and accurate Dispenser and well up in general Retail. Good references indispensable. Apply, stating age, experience, salary required, and enclose carte, to J. J. PERKINS, Chemist, Lichfield.

A YOUNG MAN, about 18 or 20, who has been accustomed to the business, as PORTER, or some similar way, and can be recommended by his last employer. One with some experience in the aërated water business will be preferred. Address, RIMMINGTON & SON, Chemists, Bradford.

MARCH 6th.—A gentlemanly ASSISTANT, about 24, thoroughly accustomed to good class Dispensing business. Apply, with carte and usual particulars, JAMESON & CURTIS, Hastings.

IMMEDIATELY.—An ASSISTANT or JUNIOR. In-doors. Only one kept. Steady, obliging, and accustomed to ordinary Retail and Dispensing business. Churchman preferred. Apply, with full particulars, to F. E. FITT, Pharm. Chemist, Barking, near London, Essex.

ASSISTANTS WANTED.

QUALIFIED Assistant, to Manage Branch of Mixed Retail. Age 25 to 30. Major man preferred. Out-door and no Sunday duty. Apply, in first instance, by letter, stating full particulars, to Manager, care of Messrs. G. B. Kent & Sons, Great Marlborough St., London, W.

AT once.—A competent in-door Assistant, not under 24 years of age, for a first-class Retail and Dispensing business. Good references indispensable. Salary £50 per annum. Apply, enclosing carte and usual particulars, to R. & C., Messrs. Hodgkinson, Stead & Treacher, 198, Upper Whitecross St., London.

MANAGING Assistant, qualified, to take sole charge of small Mixed business. Must be of sober, steady and industrious habits. One with some knowledge of Stationery trade preferred. Reply if married or single, stating terms, &c., to G. Cannon, Chemist, Great Marlow.

IMMEDIATELY.—A competent qualified Assistant, about 23 years of age. Apply personally if possible to F. W. Rouse, 114, High St., Clapham, S.W.

MESSRS. LONG & SON require a Junior Assistant. State usual particulars, enclosing carte if possible, to 2, Western Pl., Hove, Brighton.

MR. ACFIELD, of Surbiton Hill, S.W., is requiring a Junior Assistant. He must be gentlemanly, of good appearance and address, accustomed to first-class Dispensing and Retail. A Churchman preferred. Hours light. Closed on Sundays. A personal interview if possible, otherwise carte, stating full particulars, age, height, and salary required.

IMMEDIATELY.—An Assistant for a Dispensing and general country business. Out-door. Apply, stating usual particulars, to W. H. Stanway, Chemist and Dentist, Kington, Herefordshire.

A JUNIOR or Improver. One just out of his time and has passed the Preliminary. For particulars, apply, stating salary, &c., to Mr. Nichols, Chemist, Petersfield, Hants.

TRUSTWORTHY Assistant, competent to take charge during absence of principal. Must be able to Extract Teeth and willing to make himself generally useful in a country business. Apply, stating age, height, salary, &c., to A. J. Mason, Bexley Heath, Kent.

FOR a Dispensing business in first-class London suburb (S.E.), an Assistant, with Minor qualification. Salary £45 to £50. Particulars, with carte (which will be returned), to H. H., Messrs. Sanger & Sons, 489, Oxford St., W.

BOULLY & CO. have a vacancy for an Assistant Must have a good knowledge of the business, and be a sharp, active man. Sleeping accommodation and sitting room provided, without board. Apply, 85, Bishop's Rd., Bayswater.

AT once, for China, qualified Assistant, who must have a knowledge of accounts and first-class experience. Liberal terms. Apply, giving full particulars of qualifications and previous engagements, &c., to Dakin Brothers, 2 & 3, Creechurch Lane, Leadenhall St., E.C.

BY a Pharmaceutical Chemist, a thoroughly qualified. Assistant, to take charge of the Dispensing Department. Must be accurate and well up in Dispensing, bearing first-class testimonials both for Dispensing and Retail counter, which occasionally he would have to superintend. Application by letter, addressed T. R., care of Messrs. Hodgkinsons, Stead & Treacher, 198, Upper Whitecross St., London, E.C., stating height, age, &c., and salary required, out-door and in-door.

A COMPETENT Assistant, in-door, speaking English and French. Good references required. Apply to G. Jozeau, 49, Haymarket, London.

ASSISTANTS WANTED.

AN active man for Laboratory work. Wyman & Westwood, 25, Charles St., Farringdon Rd.

IN an old-established Retail and Dispensing business in the West-end, a thoroughly competent Senior Assistant, about 30 years of age or older. A gentleman seeking a permanency and who would take a thorough interest in the business would find it a comfortable situation. Minor qualification indispensable. Also a neat and accurate Dispenser. One who has had experience in a good London house and has passed the Minor preferred. Apply in the first instance either to Messrs. A. S. Hill & Sons, 101, Southwark St., S.E., or to Messrs. Herrings & Co., 40, Aldersgate St., E.C.

R. E. CHARLES, Chemist, Brecon, wants a Junior Assistant, about 19 or 20. Hours 8 to 8. No Sunday work. Write, stating age, experience, and salary required. R. E. C. also wants an Apprentice.

AT once.—To Manage a Branch. Accustomed to Prescribe, Dispense, and Extract Teeth, as well as general Retail. Also a Junior for another shop, with Mixed trade. Must be able to Dispense. Abstainers. Send photo, age, and references, naming experiences, whether passed, and what salary required. E. Griffith, Padstow.

IMMEDIATELY.—An Improver, accustomed to first-class Retail, in a select Dispensing business. Must write a good hand, quick and trustworthy, and have good reference. State height, &c., and all particulars, to Pharmaceutist, care of Evans, Sons & Co., 56, Hanover St., Liverpool.

AN active, gentlemanly Assistant, about 23 or 24 years of age, who has been accustomed to good class business. Please apply personally if possible, or enclose carte, and give full particulars in first letter, to D., 14, Highbury Park, N.

JUNIOR, good at Dispensing and Retail. Non smoker and abstainer preferred. Good personal character essential. Comfortable Christian home. State salary, age, height and experience. Send photo. and references. Minor preferred. Also a vacancy for a well educated youth as Apprentice or Improver. H. J. Thomas, Belvedere Pharmacy, Bath.

WORKING Laboratory Man, at once. Principally required for "Granular Preparations." Must be sober, industrious and thoroughly efficient. Lorimer & Co., Hargrave Park Rd., London, N.

EARLY in March.—A competent, qualified and trustworthy Assistant, of steady habits. Not under 25 years of age. Single. Only one kept. Apply, with full particulars as to experience, salary asked, age, and references, to E. Waller Martin, 68, High St., Guildford, Surrey.

AN Assistant, used to a Mixed country trade, to Manage a small Branch. Apply, stating full particulars, to Joseph Blower, Knighton, Rads.

AN in-door Assistant, about 21 or 22 years of age, accustomed to a good class country business. Must be a neat and accurate Dispenser. Apply, stating experience, age, height, and salary required, to Statim, care of Messrs. Newbery & Sons, King Edward St., London, E.C.

H. H. PARLBY, Dispensing and Family Chemist, opposite Albert Hall, Swansea, has a vacancy for an Apprentice. Terms moderate. Satisfactory references. Every opportunity for acquiring a thorough knowledge of the business.

IMMEDIATELY.—For two or three months. A good Junior Assistant (out-door), accustomed to Mixed country business, and able to Manage in absence of principal. Apply, stating age and salary required, &c., to Mr. Foulsham, Post Office, Stradbroke, Wickham Market.

ASSISTANTS WANTED.

IMMEDIATELY.—Out-door. An active, obliging Assistant, well up in Dispensing and accustomed to a brisk ready-money trade. Apply, with carte-de-visite, and state age, height, and salary expected, to E. J. Kitson, The City Drug Stores, Worcester.

AN Assistant, about 22 or 23 years of age, for a light Retail and Dispensing business. Apply, with references, &c., to G. T. Green, Chemist, Godalming.

A SECOND Assistant, age about 23, for a suburban business, who has had good experience in Dispensing, and would accept a small salary in exchange for time for study; or a good Junior or Apprentice would be treated with. Apply, with full particulars, to Chemist, Messrs. Barron, Harveys & Co., Giltspur St., E.C.

FOR the Isle of Man. A qualified Assistant. In-door. Age not under 25. Must be of good appearance and address. A liberal salary to a suitable man. Address, E. J. Bowman, 53, Victoria St., Douglas, I. O. M.

BUSINESSES FOR DISPOSAL.

AN old-established Business, in market town, Gloucestershire. Returns £600. Well-stocked. Good house and premises. Rent £25. A good opportunity for young man commencing business. In present occupant's hands 8 years. Illness cause of disposal. Price £450, or offers. Address, C. E. H., Hearon, Squire & Francis, 5, Coleman St, London, E.C.

OLD-established, sound, profitable Business (Agricultural, Prescribing, and general Retail), in South of England. Everything at full prices. Convenient house, at low rental, in one of the leading thoroughfares. Satisfactory reasons for disposal. Full particulars on application to Alpha, care of Messrs. Barron, Harveys & Co., Giltspur St., London.

ALFORD, Lincolnshire.—To be sold under the will of the late owner, an old-established Druggist and Grocer's Shop, with house and premises, situate at the corner of the market place. A lucrative Family business has been carried on upon the premises for over 60 years by the late owner and other members of his family. Stock and fixtures can be taken at a valuation. Possession 6th April. Apply to Levi Robinson, East End, Alford.

HUDDERSFIELD.—Genuine old-established Retail and Prescribing Business, in central position. Good shop, house, and excellent warehouses. Satisfactory reasons for disposal. Returns £600 to £700. Price about £650, or valuation. Apply, by letter, Medicus, 18, Bath Bldgs., Huddersfield.

£225.—In a large manufacturing village in Yorkshire, a recently established Business of a profitable nature, now returning about £6 weekly, and capable of great increase. The shop is in an excellent position at the junction of three roads. Population 5000. No other chemist or medical man in the district. Rent only £12. Taxes about £2. W. B., Clarke, Bleasdale & Co., York.

IN the centre of Essex.—A good country Business, to which Gilbey's Agency is attached, in full working order. Returns £700. Coming in £400, with immediate possession. Apply to Grimwade, Ridley & Co., Ipswich, and 7, Mildmay Chambers, 82, Bishopsgate St., London. Satisfactory reasons for sale.

IMMEDIATELY.—A Chemist having four old-established Businesses in London, managed by assistants, and returning, respectively, two £600, one £550, and one £475, each of which are well-fitted and stocked, and capable of great increase under a principal, is open to offer for either of them. Principals, by letter only, apply, with card, to Veritas, 5, South Lambeth Rd., S.W.

BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer:—Hants. Commanding corner. Well-fitted and stocked. Good house, with stable. Rent £40. Returning £425. Net profit £180. Only £260. Rare opportunity to Dentist or good Prescriber. Sussex. Old-established Retail and Agricultural trade. Nothing heavy. Same hands 40 years. Excellent house. Returning £600. For £550. East Coast. Unopposed Retail and Dispensing. Close to sea. Returns £800. Full prices. £750, or offer. London. Most important thoroughfare. Returning £2500. Net profit £750. Gentleman with £500 can purchase; balance by arrangement. London, S.W. Corner Retail, Dispensing and Prescribing. Returns £1100. Net profit £500. Owner retiring. £1100. Trial allowed. N. Old-established corner. Returning by manager, £550. Well-fitted and stocked. £550, or offer. Another. Main road. Increasing locality. Close station. 1100 houses building. Returning £460. For £325. Apply, 30, Jewry St., Aldgate, City.

READY-money Business, doing £600 per annum, in good marketing position. Large house and commanding well-fitted Shop. In suburbs of London. Net price £500. Address, letter only, P., 43, Marmion Rd., Lavender Hill, Wandsworth.

TO Chemists and Surgeons.—£250 only, for goodwill, fittings, stock and transferable lease of old-established Retail, with Dispensary attached, in a main road, S. Rare opportunity for prescribing chemist, or young or elderly surgeon. Illness cause of sale. No agents. For address, &c., apply to Messrs. Hearon, Squire & Francis, 5, Coleman St., London, E.C.

LONDON, S.E.—A nicely fitted Pharmacy, in densely populated neighbourhood. Has been opened about 12 months. Must be sold immediately. No other Chemist near. Price about £200. A great bargain. Apply to Messrs. Taylor & Co., 38, Walbrook, E.C.

LONDON, E. — Light Retail and Prescribing, in thickly populated district. Low rent, on lease. Satisfactory reasons for disposal. For particulars, apply, Delta, Hearon, Squire & Francis, 5, Coleman St., E.C. No agents.

IMMEDIATELY.—In a rapidly increasing suburb, S.E. A neatly fitted Retail, Dispensing and Prescribing Business. Grand opening for Dentistry. Main road. Long lease. Low rent. Satisfactory reason for selling. Letter for address, Statim, Mr. G. Wallis, 4, Albert Villas, Birchanger Rd., South Norwood, S.E.

PARTNERSHIP (Wholesale trade).—A gentleman, with some knowledge of the Drug and Sundry trade, with a capital of from £2500 to £3000, will find a good opening. Well-established business and large connection. Address, S. D., care of Mr. A. Cooper, 19, Coleman St., E.C.

A SOUND Business, in a second-class neighbourhood. Accommodation if required. Address, in first instance, W. B., care of Mr. J. Wooster, Broadway, Turnham Green, W.

PARTNERSHIP or for Sale.—An opportunity presents itself for a gentleman with knowledge of the Wholesale, either purchasing a valuable Wholesale and Retail Chemist and Druggist's old-established Business, West of England, providing an equal capital of about £1500 to join another (Chemist) in carrying it on. Full particulars of W. H. Phillips, 1, Small St., Bristol.

WELL-established Business. The business includes that of Druggist, Seedsman and Wine Merchant. Receipts nearly £2000 a year. Profits 30 per cent., and capable of great increase. Fittings, &c., at valuation. House in a most convenient position, with shop, warehouse, stabling, garden, &c. Rent £35. Address, C. P., care of Dr. Langley, 50, Lincoln's Inn Fields, London, W.C.

BUSINESSES FOR DISPOSAL.

BRIGHTON, 154, Marine Parade. Chemist and Druggist's Business, carried on by Mr. J. Phillips for several years. Incoming very moderate. Stock and fittings at valuation, or for sum, as may be agreed upon. Good house for letting off. Furniture can be taken at valuation or not. Rental only £70. Lease about 7 years to run. Apply to Edmonds, Clark & Co., Chartered Accountants, Post Office Chambers, 56, Ship St., Brighton.

OLD established Mixed. In consequence of death of proprietor. A large Mixed Business, with Mineral Water trade attached, in full working order. Returns about £5000. Established nearly a century, and has always been in one family. Within 15 miles of London. Apply to C. M., care of Barron, Harveys & Co., Giltspur St.

UNOPPOSED Drug Business. Immediately. Owing to failing health of proprietor. Situate in market place of pleasant country town in North of England. Established in 1841. Large district. Rent nominal. Returns about £700, and capable of large increase. Apply to John Ismay & Sons, Wholesale Druggists, Newcastle-on-Tyne.

WANTED TO PURCHASE.

A BIRMINGHAM Chemist, having engagements which necessitate his residing in or near London, wishes to exchange his Business (returning £400, price £250) for a larger one in or within 20 miles of London, and pay the difference in cash in the value of the two businesses. James Keeling, Chemist, Cartland Rd., Birmingham.

SMALL Chemist's Business, in a small country town or large village. Address, A. R., 66, Belsize Rd., St. John's Wood, N.W.

A FIRST-CLASS light Retail and Dispensing Business, in town or country, showing a net profit of about £400 per annum. A minute investigation would be required. Full particulars, in confidence, to H. B., care of Mr. White, Penge Rd., South Norwood, S.E.

Messrs. TAYLOR & CO.

Valuers & Transfer Agents,

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Have 240 businesses in London and the provinces on their Register for disposal.

Gentlemen seeking suitable opportunities for entering business are invited to send particulars of their requirements.

No charge to purchasers.

Valuation appointments for the current month should be made at once.

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TO THOSE ABOUT COMMENCING BUSINESS.

FOR Sale.—The Stock and Fixtures of a Chemist's Shop, in excellent condition, when new costing £225. No reasonable offer refused. Can be seen at 238, Well St., Hackney.

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All information can be obtained on application to the Secretary, South Kensington, London, S.W.

CONVALLARIA MAJUS.

LILY of the Valley Roots now offered, in large or small quantities, by Messrs. Pred & Greaves, Horticultural Auctioneers, 1, Holland Rd., Brixton, S.W.

FOR SALE.

BEST plate glass Counter Cases, as fig. A 16, 2ft. 6in., 3ft., 3ft. 6in., 4ft., 5ft., 6ft., 6ft. 6in.; as fig. A 1, 5ft. long, £9; 3ft. 6in., as fig. A 4, £7; as fig. A 6, 5ft., £5; fig. A 7, 6ft. long, £6; as fig. A 9, 35s.; as fig. A 10, 50s.; large size, 60s.; 4ft., as fig. A 17, 80s.; 4ft. 6in., A 17, 85s.; 10ft., as A 15, £10; Desk and Case, plate glass, fig. 31; Show Steps, A 37, 70s.; A 38, 30s.; A 40, 45s.; Soda Water Stand, 45s., A 57; all the above cases are plate glass. E. Natali, 207, Old Street, E.C.

A 6 FT. plate glass Dispensing Screen, fig. A 55, very handsome figured mahogany, silvered glass back inside case, and fitted with glass (shifting) shelves, with polished edges, tablet on top; a 4ft. do. do., as fig. A 54. E. Natali, 207, Old Street, near Pitfield Street, E.C.

A ROTARY Pill Machine and Piping Press; 6 doz. 1-gall. white glass Tincture Bottles; 6 doz. 80-oz. ditto; Specie Jars, Ointment Jars, Fancy Jars, Brass Pillar Scales, fig. 1, 20s.; Pill Machines (to cut 24), 3, 4, or 5-grain, 16s.; 5-grain ditto, marble slab, 18/6; a number mahogany nests Drawers, glass labels and knobs, at 2/6 per drawer, 10 drawers to every 2ft.; 12ft. Spanish mahogany Counter, fitted with drawers; a 14ft. mahogany Counter, fitted with glass cases in front and drawers under; 12ft. mahogany top, grained front, fitted with drawers; 7ft. and 10ft. mahogany top Cupboards; a 6ft. mahogany top Counter, fitted with glass cases in front and drawers under; a quantity of mahogany fronted Shelving, Cornice, Pilasters, Lockers. E. Natali, 207, Old Street, near Pitfield Street, E.C.

A NUMBER of Mortars and Pestles; 5ft., 6ft., 7ft. splendid mahogany Dispensing Screens, glass case at each side, silvered plate glass centre, with marble slab in front, shelves at back for Dispensing bottles, with handsome tablets on top, £7 10s. E. Natali, 207, Old Street, near Pitfield Street, London, E.C.

A HANDSOME plate glass and mahogany Counter Case, with upright case on top, as fig. A 4, £7, 3ft. 6in. long; a 5ft. plate glass Counter Case, revolving front glasses, fig. A 1, £9; a 8ft., as fig. A 18, £8; 6ft., A 18, £6; 5ft., as A 18, £5; splendid mahogany and plate glass Wall Case, A 88, 8ft. long, £28; Sponge Cases, as A 41, 60s.; A 43, 90s.; Desk and Glass Case, fig. 31, plate glass, 60s. E. Natali, 207, Old Street, near Pitfield Street, E.C.

WANTED

A GENTLEMAN with a few hundred pounds to introduce a Patented Article for sale by chemists and druggists, and which, from exceptional circumstances, is likely to be a great success. Address, Inventor, at May's, 159, Piccadilly, W.

Midland Counties' Transfer Agency.

F. J. BRETT,

Trade Valuer and Auctioneer,

LEICESTER.

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Businesses thoroughly investigated for Buyers.

YORKS.—Old-established Retail, Dispensing and PRESCRIBING, returns £1300, valuation, £900.

LONDON, N.—Retail and PRESCRIBING, good Specialities, returns £500, in addition agency produces £30 per annum, price £450, or reasonable offer.

MIDLANDS.—Returns £1200, half profit, price £800.

HANTS.—Returns £500, fine position, illness cause of sale, price about £500.

LANCS.—Good RETAIL, in commanding position, returns £1100, price £1000.

YORKS.—Returns £600, at valuation, £700.

GLOUCESTERSHIRE.—High class Retail and DISPENSING, Returns over £600, at valuation, £500.

MIDLANDS.—Mixed Drug and DRYSALTERY, returns cash £2000, net profit £400 to £500, price £700.

STAFFS.—Mixed TRADE, returns £800, at valuation, £450.

MIDLANDS.—BRANCH, returns £500, at valuation, £400.

WALES.—One of the best RETAILS in Mid-Wales, returns, Drugs, £1000, Wines, &c., £800, full prices, about £1200.

DURHAM Co.—Cash Retail and PRESCRIBING, good prices, returns £700, price £500.

HEREFORDSHIRE.—Pretty country RETAIL, returns £550, at valuation, £300.

NORFOLK.—Country RETAIL, capable of increase, returns £1100 to £1200, price £900.

LONDON, N.—Dispensing and light RETAIL, part house let off, returns as branch £500, price £450, or reasonable offer.

NORTH WALES.—Old established Retail, Prescribing and DISPENSING, at full prices, returns about £700, 8-roomed house, rent £26, at valuation, about £250 to £300.

SALE BY TENDER.

F. J. BRETT is instructed to offer by Tender, on Feb. 29, the entire stock and fixtures of the Dispensing and Surgeon's Wholesale BUSINESS, conducted by Mr. Humphreys for many years at 43, Bull St., Birmingham. Abstracts and full details, with forms of Tender, will be prepared and sent to buyers in due course. Further details in future advertisements. Full particulars can be had from the offices, 23, Rutland St., Leicester.

Transfers, Valuations and Auctions conducted throughout the United Kingdom by Mr. BRETT, Leicester.

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Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

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H. G. has selected the following from his Register for special notice :—

SOUTH DEVON.—Through death of the proprietor. Old established BUSINESS. Returns average £970.

Seaside, DEVON.—Returns £500. No opposition.

SOMERSET.—PARTNERSHIP in first-class business and ultimate succession. Returns £1800.

DEVON.—Profitable TRADE. Returns £500. Price £270.

Several businesses are offered at a valuation of stock and fixtures.

Full particulars on application.

CHEMISTS' TRANSFERS.

32, LUDGATE HILL, LONDON.

MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

PURCHASERS who desire early information regarding eligible opportunities for entering business, will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

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MESSRS. ORRIDGE & CO. are instructed to transfer the following businesses, particulars of which, with order to view, may be obtained on application:—

1. LONDON, W.—In a good class locality. Dispensing and RETAIL. Returns £800. Good house, well situate. Price about £750.
2. LONDON, N.W.—Good class Dispensing and RETAIL. Returns £650, with good profits. Large house. Rent £42. Good lease. Splendid opening for a Dentist. Price about £600.
3. LONDON, E.—Retail, Dispensing and PRESCRIBING. Situate in a good business locality. Very profitable. Returns £600. Price about £550.
4. LONDON, N.W.—Good class Dispensing and RETAIL. Returns £700. Handsomely fitted shop and good house. Rent moderate. Small premium for goodwill and valuation.
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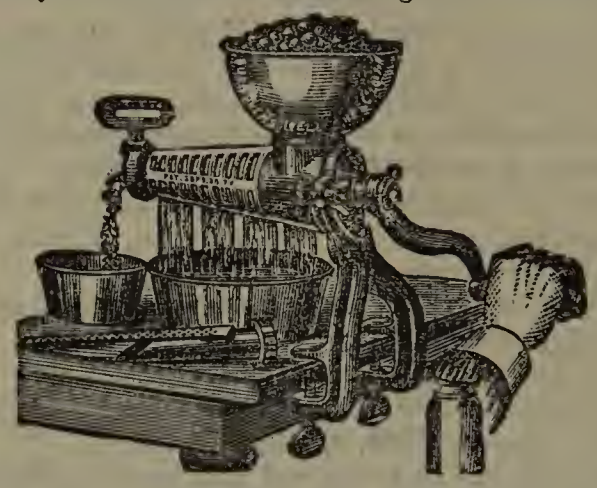
Specially adapted for Coarse and Fibrous Drugs.

The principle upon which this Press operates is, that the drug is acted upon in a continuous thin layer which is forced forward by each revolution of the screw into smaller and smaller space, the leverage yielding a force so powerful as to extract almost the entire moisture, delivering the residue of suitable drugs with almost crisp dryness, and, as experience has shown, it saves a greater amount of Tincture (very important in the case of Tincture of Opium and other expensive drugs) than even the most powerful Hydraulic Press. So thorough is its action in this



respect that the *Chemists' Journal* has humourously remarked of it that "it will almost squeeze blood out of a turnip." One firm informs us that they have saved at least £20 more in three months, by the use of this Press, than they could secure by using any other. The working of this Press being continuous, either small or very large quantities may be operated upon at one time, and much more rapidly than in any other form of apparatus.

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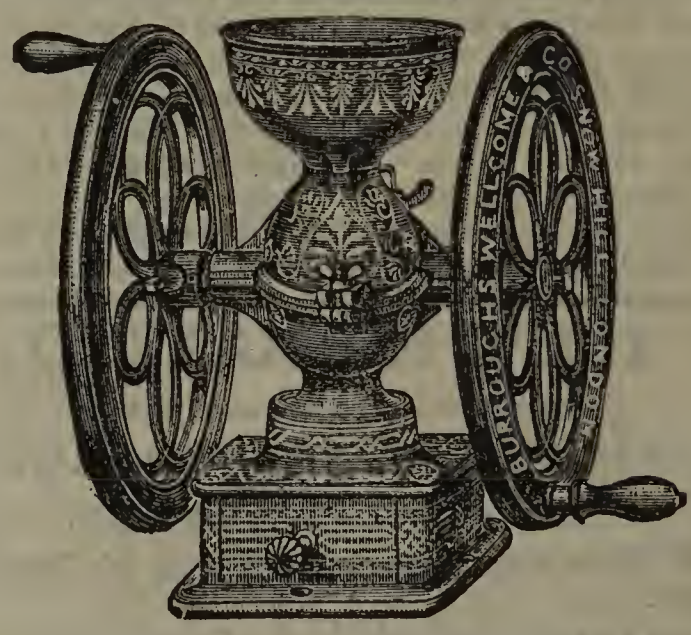
Constructed on an improved principle, the cutters being easily removable for inspection, or for cleaning. It may be regulated to grind to any degree of fineness or coarseness, by simply turning a single thumbscrew. It is adapted to almost any dry pulverizable substance; it works rapidly, and is economical.

Professor MAISCH, one of the highest American authorities on pharmacy, says that "It is the best drug mill that has yet been devised. It is intended to displace the use of the mortar for general purposes in pulverizing drugs."



Prices { Plain ... ... 40s., 60s., 100s. / Ornamented 50s., 70s., 110s. } each.

Subject to the usual Discount for Cash.

All of the Articles mentioned above may be obtained from any respectable wholesale firm, or from BURROUGHS, WELLCOME & CO., of SNOW HILL BUILDINGS, LONDON, E.C., the Sole European Depôt.

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The Pharmaceutical Journal AND Transactions.

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For the Relief of Distressed Members or Associates of the Society, of Pharmaceutical Chemists, and Chemists and Druggists, and their Widows and Orphans.

There are at present *forty* annuitants, receiving £1350 per annum, and casual relief is also granted, amounting to nearly £700 per annum, involving a total annual expenditure of upwards of £2000.

DONATIONS OR SUBSCRIPTIONS ARE EARNESTLY SOLICITED.

Cheques and Post Office Orders to be made payable to ELIAS BREMRIDGE.

For particulars respecting the Fund see page 696.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, March 5th.

The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on March 5th should be forwarded to the Secretary not later than Wednesday, the 27th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

CATALOGUE OF THE MUSEUM.

The Catalogue of the Museum may be obtained from the Secretary, price 2s.; or by post, 2s. 4d. Each Member, Associate, and Apprentice of the Society will be supplied with one copy *gratis*, on application to the Secretary.

ANNUAL SUBSCRIPTIONS.

All Annual Subscriptions are now due.

Subscription payable by Members and Associates in Business £1 1 0

Subscription payable by Associates and Apprentices or Students 0 10 6

Cheques and Post Office Orders should be made payable to the Secretary, and crossed "London and Westminster Bank."

LIBRARY AND MUSEUM.

The Library is open daily from 9 a.m. until 10 p.m. (Saturdays, 9 a.m. to 2 p.m. only.) The Museum is open daily from 9 a.m. until 5 p.m., and from 7 p.m. until 10 p.m. (Saturdays, 9 a.m. to 2 p.m. only.)

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THE SCHOOL OF PHARMACY

OF THE

Pharmaceutical Society of Great Britain.

FORTY-SECOND SESSION—1883-84.

CHEMISTRY AND PHARMACY..... Professor REDWOOD and Mr. DUNSTAN.
On Monday, Tuesday, and Wednesday Mornings, at 9 o'clock.

BOTANY AND MATERIA MEDICA .....Professor BENTLEY.
On Thursday, Friday, and Saturday Mornings, at 9 o'clock.

PRACTICAL CHEMISTRY ..... Professor ATTFIELD.
Daily at 10 o'clock, in the Laboratories.

RE-COMMENCEMENT OF LECTURE COURSES.

The course of Lectures on "Chemistry and Pharmacy" will re-commence on Monday Morning, March 3rd, at 9 o'clock, and on "Botany and Materia Medica" on Saturday, March 1st, when Professor Bentley will give his first lecture on Botany. The Course on Materia Medica and Botany will include the Lectures on Systematic and Practical Botany, which will be delivered in the Gardens of the Royal Botanic Society, Regent's Park.

THE LECTURES ON CHEMISTRY AND PHARMACY

Will re-commence on Monday, March 3rd, 1884.

They comprise the following subjects:—

1. An exposition of the physical forces involved in chemical and pharmaceutical operations and changes.

2. The chemistry of inorganic bodies, including a description of the elements and their more important inorganic compounds, especially those used in medicine.

3. The chemistry of organic compounds, with a description of such as have important applications in the arts and in medicine.

The subjects are fully illustrated with experiments, diagrams and specimens, and examinations of the class are held on those subjects which have been previously treated of in the lectures.

With the view of connecting the lecture teaching with the instruction given to the practical class in the laboratories, the Demonstrator of Practical Chemistry conducts these examinations. Supplementary lectures upon Chemistry and Physics are also delivered by Mr. Dunstan during the course.

The class in Practical Dispensing and the Reading of Prescriptions is conducted by Mr. Joseph Ince, and meets twice a week at 5 p.m.

THE LECTURES ON BOTANY AND MATERIA MEDICA

Will re-commence on Saturday, March 1st, 1884.

They comprise the following subjects:—

1. Structural and Physiological Botany, which is especially adapted to meet the requirements of pharmaceutical students.

2. Organic Materia Medica, comprising the medicinal substances obtained from the organic kingdom, which are considered in the order of the natural historical relations of the organized beings which produce them.

3. Systematic and Practical Botany, which is taught during the summer months in the Royal Botanic Society's Gardens, Regent's Park.

All the Lectures are fully illustrated by every means to which recourse can be had, including fresh, dried, and preserved portions of plants, together with their products and secretions; and by an extensive series of drawings, diagrams, and preparations, as well as by experiments and microscopical preparations.

In order to test the proficiency of the pupils, and to bring them into more intimate intercourse with the Professors, a *vivâ voce* examination is held after each Lecture. It is expected that all pupils will attend these examinations.

INSTRUCTION IN PRACTICAL CHEMISTRY

Is conducted in the Laboratories by the Professor and Demonstrator. The Laboratories are open from ten o'clock in the morning until five in the afternoon daily, except on Saturdays, when they are closed at two o'clock. They are fitted up with every convenience for the study of the principles of Chemistry by personal experiment. They are specially designed for the student of Pharmacy, but are equally well adapted for the acquirement of a knowledge of Chemistry in its application to Medicine, Manufactures, Analysis, or Original Research. There is no general class for simultaneous instruction, each Student following an independent course of study always determined by his previous knowledge; pupils can therefore *enter for any period at any date.* A Junior course occupies about five months. A complete course of instruction, including the higher branches of Quantitative Analysis, occupies ten full months, and is dated from the day of entry to that day twelvemonth.

With a view of testing and maintaining the progress of Students the Professor holds examinations frequently. He expects all pupils to attend these classes.

Application for Admission to the School, for Prospectuses, or for further information, may be made to the Professors or to their Assistants in the Lecture Theatre, or Laboratories, 17, Bloomsbury Square, London, W.C.

NOW READY.

Price 1s., or post free, 1s. 5½d.

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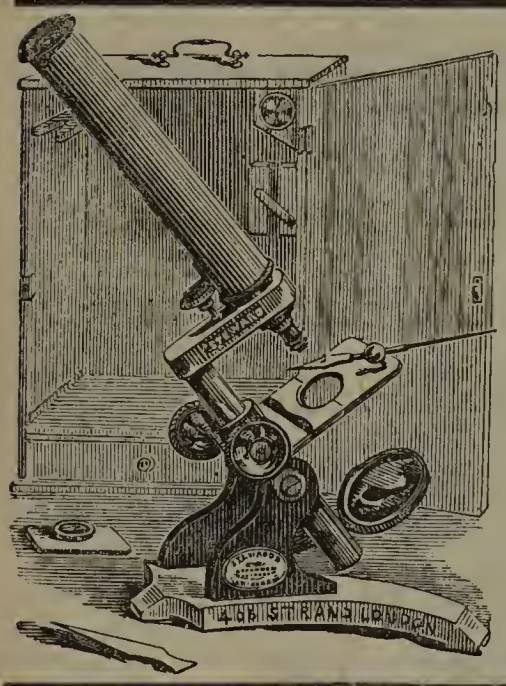

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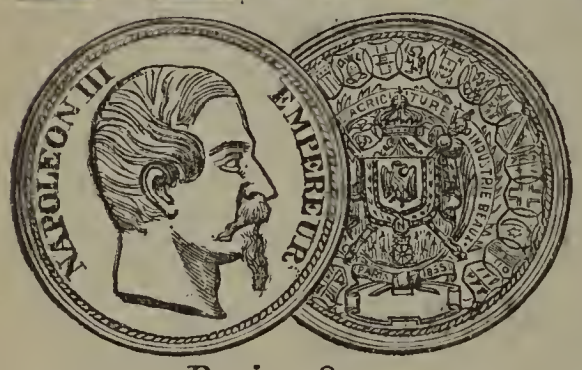

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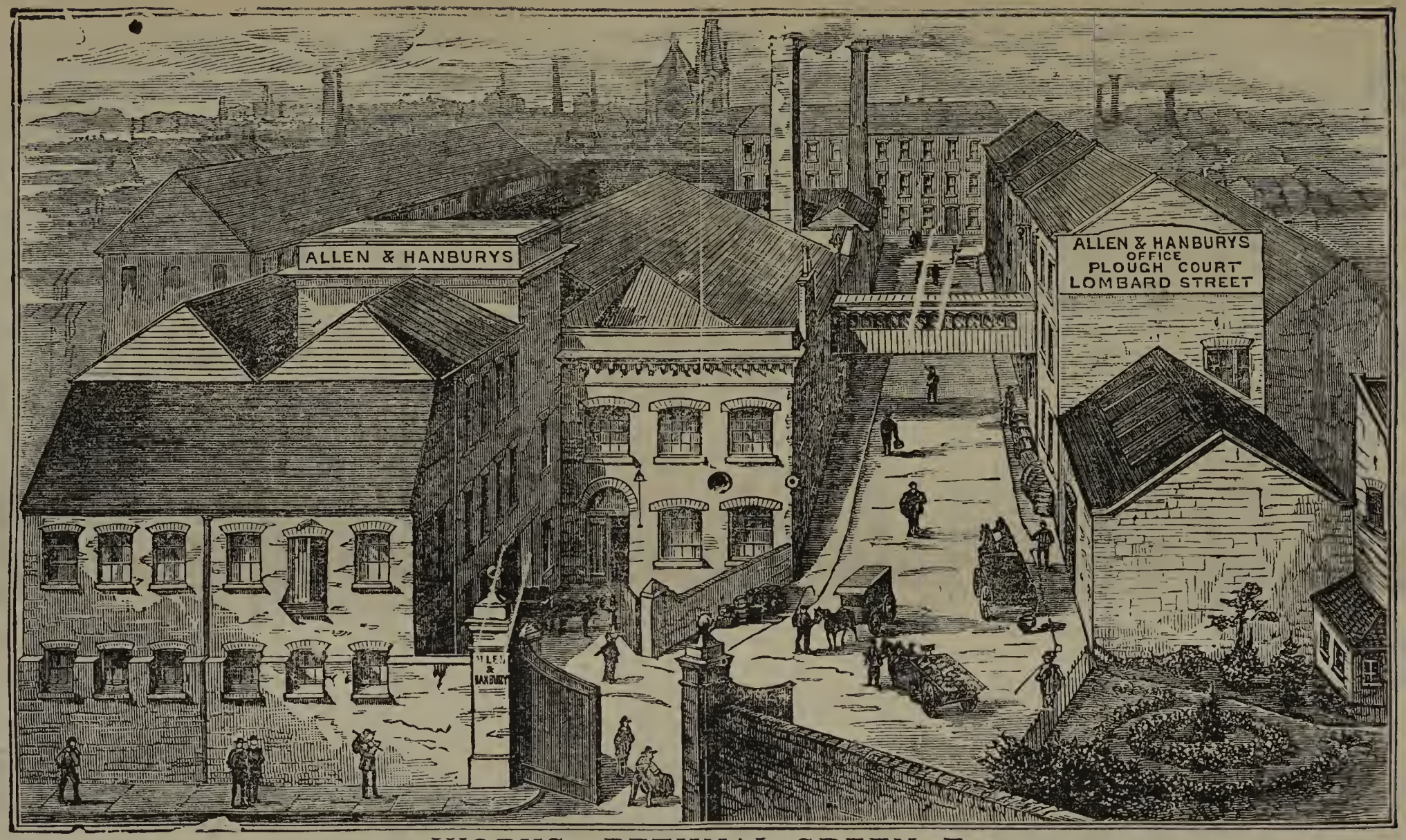

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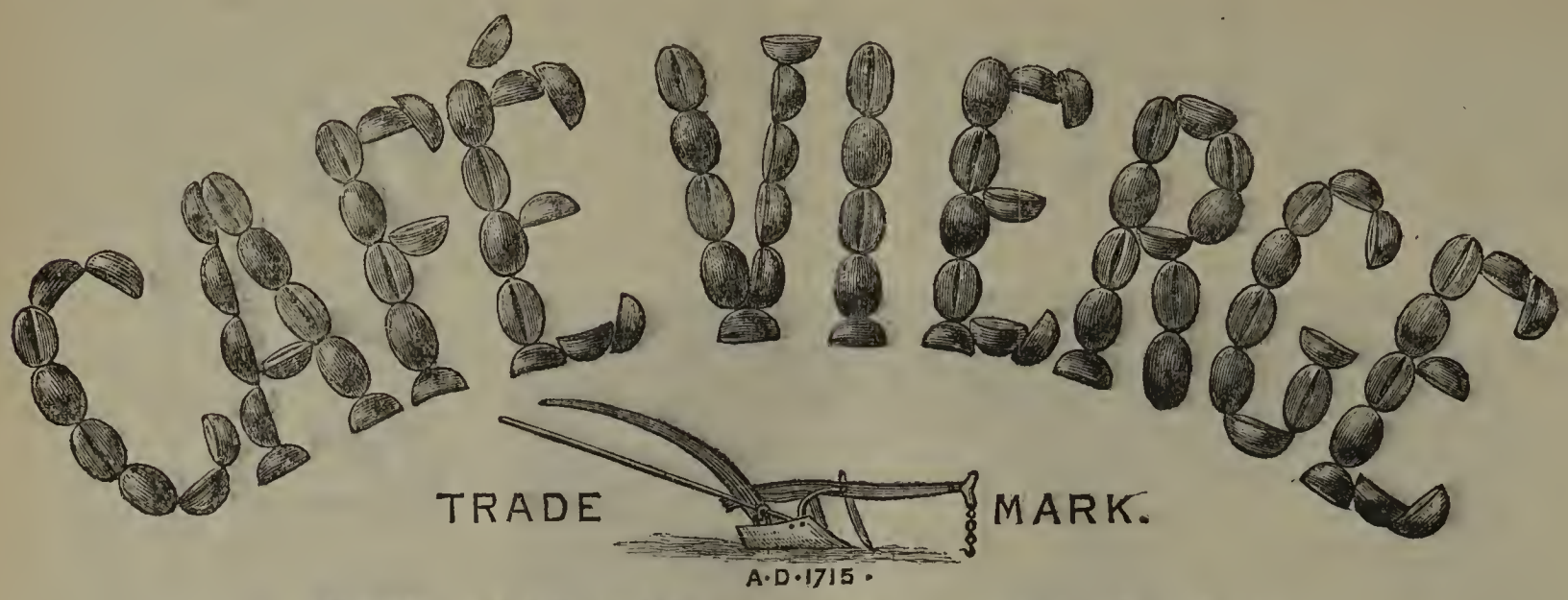

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Pulv. Cambogiæ,	1¼ grs.

CATHARTIC COMP. (Improved).

Ext. Colocynth Comp.,	1½ grs
Ext. Jalapæ,	⅛ gr.
Resin. Podoph.,	⅛ gr.
Resin. Leptand.,	⅜ gr.
Ext. Hyoscyami,	¼ gr.
Ext. Gentianæ,	½ gr.
Ol. Menth. Pip.,	1-40 gtt.

COLCHICI, IPECAC. ET COLOC.

Ext. Colch. Acet.,	½ gr.
P. Ipecac. Comp.,	1 gr.
Ext. Coloc. Co.,	3 grs.

COLOC. COMP. EXT. HYOSCYAMI ET HYDRARG. PIL.

Hydrarg. Pil,	2 grs.
Ext. Coloc. Comp.,	2 grs.
Ext. Hyoscyami,	1 gr.

DAMIANÆ, NUC. VOM. ET PHOSPHORI.

Ext. Damianæ,	2 grs.
Ext. Nucis Vomicæ,	⅛ gr.
Phosphori,	1-100 gr.

ERGOTIN (made of specially reliable Ergotin), 1 gr., 3 grs.

ERGOTIN COMP. (Dr. Clement Godson's).

Ergotin,	3 grs.
Ext. Cannab. Ind.,	1-6 gr.
Strychniæ,	1-60 gr.

EUONYMIN ET COLOC. COMP. EXT.

Euonymin,	1 gr.
Coloc. Comp. Ext. P. B.,	3 grs.

FERRI ARSENIAT, 1-20 gr., ⅛ gr., ¼ gr.

FERRI IODIDI, 1 gr. (Blancard's Formula).

FERRI, QUINIÆ et STRYCH. PHOSPH.

Ferri Phosphat.,	2 grs.
Quiniæ Phosphat.,	1 gr.
Strychniæ Phosphat.,	1-60 gr.

FERRUGINOUS (Blaud's), (unaltered Protoxide of Iron), 3 grs., 5 grs.

HYDRARG. SUBCHLOR. ET OPII.

Hyd. Subchlor.,	2 grs.
Opii Pulv.,	½ gr.

HYDRARGYRI IODIDI RUB., 1-25 gr., 1-16 gr.

HYDRARGYRI IODIDI VIRID., ⅛ gr., 1-6 gr., 1-5 gr., ¼ gr., ½ gr.

HYOSCYAMIÆ (Pure Crystallised Alkaloid), 1-300 gr., 1-200 gr., 1-100 gr.

IODOFORMI ET FERRI.

Ferri Redact., Quevenne's,	1 gr.
Iodoformi,	1 gr.

NEURALGIC (Dr. Gross').

Quiniæ Sulph.,	2 grs.
Morphiæ Sulph.,	1-20 gr.
Strychniæ,	1-30 gr.
Acidi Arseniosi,	1-20 gr.
Ext. Aconiti fol.,	½ gr.

OPII, CAMPHORÆ ET ACIDI TANNICI.

Pulv. Opii,	¼ gr.
Camphoræ,	1 gr.
Acidi Tannici,	2 grs.

PEPSIN., BISMUTHI ET STRYCHNIÆ.

Pepsin. Sacch.,	2½ grs.
Bismuth. Subnit.,	2½ grs.
Strychniæ,	1-60 gr.

PHOSPHORI, 1-100 gr., 1-50 gr., 1-33 gr., 1-25 gr., 1-20 gr.

PHOSPHORI COMP.

Phosphori,	1-100 gr.
Ext. Nucis Vomicæ,	¼ gr.

PHOSPHORI, FERRI ET NUCIS VOMICÆ.

Phosphori,	1-100 gr.
Ferri Phosphat.,	½ gr.
Ext. Nucis Vomicæ,	⅛ gr.

PODOPHYLLIN COMP.

Resin. Podophylli,	½ gr.
Ext. Hyoscyami,	⅛ gr.
Ext. Nucis Vomicæ,	1-16 gr.

QUINIÆ SULPHATIS, ½ gr., 1 gr., 2 grs., 3 grs., 4 grs., 5 grs.

QUINIÆ, ACIDI ARSENIOSI ET NUCIS VOMICÆ.

Quiniæ Sulphatis,	1 gr.
Acidi Arseniosi,	1-60 gr.
Ext. Nucis Vomicæ,	¼ gr.

QUINIÆ, PHOSPHORI, FERRI ET NUCIS VOMICÆ.

Quiniæ Sulphatis,	1 gr.
Phosphori,	1-100 gr.
Ferri Carb. (Vallet's Mass),	1 gr.
Ext. Nucis Vomicæ,	¼ gr.

RHEI COMP., HYD. CUM CRETÂ ET NUCIS VOMICÆ.

Pil. Rhei Co., P.B.,	3 grs.
Hyd. cum Cretâ,	1 gr.
Ext. Nuc. Vomicæ,	¼ gr.

SALICIN, 2 grs., 3 grs., 5 grs.

ZINCI VALERIANATIS, 1 gr.

SCHIEFFELIN & Co.'s General Price List of Pills and Book of about 300 Formulæ sent free on application.

AGENTS FOR GREAT BRITAIN AND IRELAND—

Allen & Hanburys, Plough Court, Lombard Street, London.

Liquor Cinchonæ Cordifoliæ,

1 to 15. per lb. 10s.

Thirty minims of this preparation diluted to 1 oz. with distilled water forms the Decoctum Cinchonæ Flav. of the Pharmacopœia.

Liquor Taraxaci, per lb. 4s.

Liquor Sequale Cornuti, per lb. 10s.

And all other Concentrated Infusions made from the well known

FIELD'S FORMULÆ.

See "Pharmaceutical Journal," March 10, 1883.

TO BE OBTAINED OF ALL WHOLESALE HOUSES, OR FROM THE MANUFACTURERS,

CLEAVER, BUCKWELL & CO.

9, GREAT CASTLE STREET, W.

LIQUOR BISMUTHI. SCHACHT.

Dose, ℥j, diluted.

Great pains are taken to ensure the absolute purity of this preparation. It is not only freed from the ordinary contamination of the metal, such as copper, arsenic, silver, &c., but that which so frequently causes an offensive odour to pervade the persons of those taking the ordinary preparations of Bismuth, namely TELLURIUM, is also most carefully eliminated.

Syr. Cinchonæ Alcoholicus, Schacht.

Bark minus the woody fibre. Dose, 10 to 30 drops, diluted.

Liquor Rhamni Frangulæ, Schacht.

A real aperient, mild and constant. Dose, ℥ij to ℥iv, diluted.

Syrupus Sennæ Aromaticus, Schacht.

Made by cold maceration—does not gripe. Dose, ℥j to ℥ij.

Succus Fuci Vesiculosi, Schacht.

The preserved conceptacular juice of the plant in its most active condition. This preparation has been used with excellent results, both internally, and also as an Embrocation in Rheumatism, &c. Dose, ℥j to ℥ij.

The above Preparations are manufactured by Mr. Schacht himself in the laboratory of the firm.

GILES, SCHACHT & CO.

52, ROYAL YORK CRESCENT,

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And can be procured from

BARCLAY & SONS, W. EDWARDS & SON, and all Wholesale Druggists in London and the Provinces.

JOHN BAILY, Pharmacist,

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Manufacturer of fine Pharmaceuticals (NON-SECRET *preparations*).

Nitro-Glycerine Lozenges, $\frac{1}{30}$, $\frac{1}{50}$, $\frac{1}{100}$ gr. in each.

Ammonio-Citrate of Bismuth Lozenges.

Syrup Hypophosphite of Quinine, Iron and Strychnine (Easton's strength).

Tincture of Phosphorus, 1 in 200. A stable preparation, palatable when taken in cream or cod liver oil.

Also Inventor of the Lozenge Paste for the slow administration of potent medicines in exact doses, prepared in the same time as making pills.

THE Celebrated Preparations of the Chevalier RUSPINI are carefully compounded from the original recipes.

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4s. 6d. and 10s. 6d.

RUSPINI'S ASTRINGENT TINCTURE, for the Teeth and Gums,

2s. 9d. and 5s. 6d.

N.B.—The price of the Tincture has been very greatly reduced.

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Boxes, 1s. 6d., 2s. 9d., 4s. 6d., and 10s. 6d., according to size.

RUSPINI'S ELIXIR, for the Cure of Toothache,

One Shilling.

These articles are wrapped in blue paper with yellow labels, and the Government Stamp is signed "RUSPINI."

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DISTILLERS AND IMPORTERS OF ESSENTIAL OILS

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Are under the personal direction of MR. JOHN MOSS, *Pharmaceutical Chemist, Fellow of the Chemical Society and of the Institute of Chemistry,* and have just been refurnished with modern Steam and Hydraulic appliances; *all*

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Are of guaranteed excellence and purity, and in addition to B. P. articles and those non-official preparations required in the general business of a Pharmacist, we make up Private Formulas in quantity, and supply the preparations of Foreign Pharmacopœias.

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COD-LIVER OIL. TASTELESS CASTOR OIL.

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Special Quotations to large buyers. Price Lists on application.

TOWLE'S CHLORODYNE

The Original Preparation, as approved by the Medical Profession on account of its known composition and uniform strength.

Retail at 13½d., 2s. 9d. & 4s. 6d. Dispensing, 4 ozs., 4s. 6d. & 10 ozs. 11s. stamped.

LIQ. CHLORODYNII,

As originally Introduced by A. P. Towle, and free from stamp duty for dispensing.

4 ozs., 4s.; ½ lb., 5s. 6d.; 1 lb., 10s.

TOWLE'S CHLORODYNE LOZENGES AND JUJUBES,

In 1, 2, and 4 lb. Bottles, at 3s. per lb., and 6d. and 1s. Boxes. Foiled, Lined and neatly got up for the counter, 4s. 6d. and 9s. per dozen.

A. P. TOWLE (Chlorodyne Manufacturer), 75, Back Piccadilly, MANCHESTER.

Bills with name on application with instructions for forwarding.

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The only brand warranted genuine by Baron Liebig.

CAUTION.—Numerous inferior and low-priced substitutes being in the market with misleading titles, labels and portraits of the late Baron Liebig, purchasers must insist upon having the Liebig Company's Extract of Meat.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

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The original Manufacturers of Essence of Beef (green label under wrapper), and other Specialities for Invalids, have

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From their SOLE ADDRESS, No. 11, LITTLE STANHOPE STREET, MAYFAIR, W., and caution the trade to

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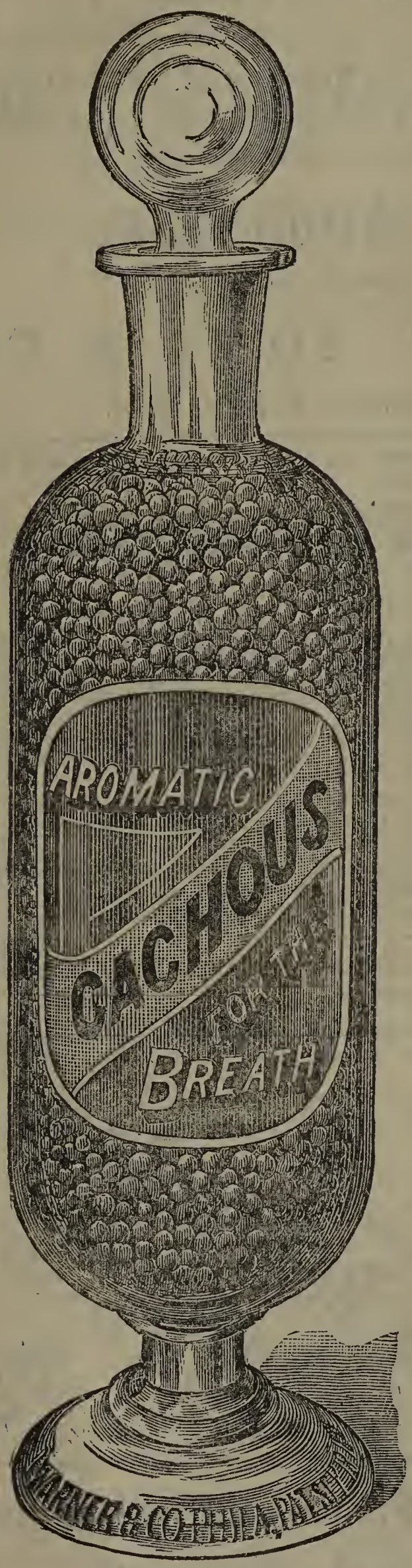

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(Shape patented and registered as an ornamental design.)

Correspondence solicited. Fully detailed Catalogues furnished on application.

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Sugar-Coated Pills

ALSO SUPPLIED IN THESE VASES

(1000 or 2000 Pills in each, in small or large Vase) at very advantageous prices.

EIGHT PRIZE MEDALS.

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SUGAR-COATED

Pil: Cathartic & Liver

"No. 120" (OFFICINAL).

The Scammony is of our own importation and the other ingredients are prepared with the utmost care.

SOLD IN 100's, 500's, and 1000's.

SPECIAL QUOTATIONS FOR LARGE QUANTITIES IN BULK.

If a good pill at less price is desired, we recommend our

Pil: Cathartic Comp:

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SOLD IN POUNDS—1200 PILLS.

Orders received from all parts of the World.

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Spiritus Ætheris Nitrosi

Guaranteed to contain the proportion of Nitrous Ether directed by the British Pharmacopœia.

Æther Nitrosus and Sol. Ætheris Nitrosi

Respectively 8 and 4 times the strength of the Spirit.

Spirit. Ammoniæ Aromaticus

Distilled from Volcanic Ammonia.

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Since the introduction of Pepsine by BOUDAULT and Dr. L. CORVISART, BOUDAULT'S Preparations have been considered the most reliable.

BOUDAULT'S PEPSINE.

The Paris Hospitals have used no other.

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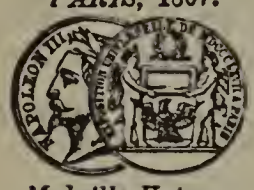
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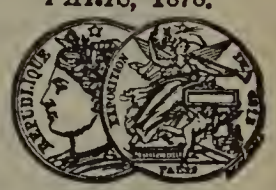

The Jury of the International Exhibition, Paris, 1867, awarded to BOUDAULT'S Preparations the *only* Medal given for Pepsine. Since that time it has taken the Medal at each of the International Exhibitions—Havre, Lyons, Vienna, Philadelphia, and Paris, 1878.

BOUDAULT'S PEPSINE—dose, 5 to 10 grains—in bottles, one ounce, 5/-; in bottles, half-an-ounce, 3/-
BOUDAULT'S PEPSINE WINE—dose, a tablespoonful—in bottles, 4/- and 8/-
BOUDAULT'S PEPSINE PILLS AND LOZENGES—dose, 2 to 4—in bottles, 3/3.

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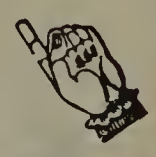

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DRUGS, CHEMICALS, PHARMACEUTICAL PREPARATIONS, BOTTLED DRUGS AND SPECIALITIES, CONCENTRATED SOLUBLE ESSENCES, FRUIT ESSENCES, ESSENTIAL OILS, & ALL MATERIALS REQUIRED BY MINERAL WATER MAKERS & CONFECTIONERS.

FORWARDED FREE ON APPLICATION.

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SPECIAL QUOTATIONS FROM ABOVE LIST. Terms—5 per cent. Discount for Cash Monthly, or 6 per cent. Discount on Foreign Indents accompanied by remittance. Any of our Specialities can be had with Plain Labels, or in large quantities with Purchaser's Name instead of ours.

PARRISH'S CHEMICAL FOOD.

From the original formula.

In bottles containing ¼ lb., **3/9** per doz.; ½ lb., **5/6** per doz.; 1 lb., **9/9** per doz. In bulk, lb. **8***d.*; by cwt. **6½***d.*

Guaranteed to contain Phosphate of Iron in the Ferrous state, and the other phosphates in combination with pure Phosphoric Acid and finest English refined sugar.

CALISAYIN.

REGISTERED.

The Sulphate of the entire Crystallizable Alkaloids obtained from the three varieties of CINCHONA BARK.

100 parts consist of 75 Alkaloids (Quinine Quinidine, Cinchonidine and Cinchonin), 9 Acid, and 16 Water.

Calisayin resembles Quinine in appearance, Solubility in Diluted Acids, Medicinal Properties, and in its mode of administration.

Calisayin is equal to Quinine as a Tonic, Febrifuge, and Anti-periodic.

The price is much less than that of Quinine. In ½, 1, and 4 oz. bots., oz. **2/9**.

FERRI ET CALISAYIN CITRAS.

(Containing 25 per cent. pure Crystallizable Citrate of Calisayin).

In fine Scales readily soluble in water, per oz. 10*d.*

The above combination of Calisayin with Citrate of Iron is equal in therapeutical value and general characteristics to the Ferri Quiniæ Citras, P.B.

LORIMER'S CIGARETTES.

In slide Boxes, containing **10** Cigarettes to retail at **9***d.* each, **6/** per doz.; containing **25**, **1/6** each, **12/** per doz.

These Cigarettes contain Cubebs, Stramonium, Cannabis Indica, and Camomiles, and are most useful in all cases of Catarrh, Asthma, Cold in the Head, Bronchitis, and diseases of the throat. They make a pleasant smoke, and are largely prescribed by Physicians. In Asthma, one before bed will give a comfortable night's rest, and are most useful in foggy and damp weather. The ingredients are of best quality down to wrappers, which are warranted pure rice paper, and being of our own manufacture, we can with confidence recommend them.

CORN CURE, LORIMER'S.

Speedy, safe, and effectual for hard or soft Corns. In Fancy Cases containing 1 doz. **1/** bottles, with Brush, &c., complete, per case, **7/**.

SALINE, EFFERVESCING (finely granulated).

A pure well-dried mixture of definite composition which in dissolving produces a sustained sparkling effervescence, and a clear, bright solution. Chemists will find this preparation advantageous and most reliable to sell as their own. Price per lb., **1/2**; **14** lbs., **1/1**; cwt., **1/**. In 8-oz. patent stoppered saline bottles, without labels or wrappers, **8/** per doz., **84/** per gross; with labels and wrappers, **10**, per doz., **108/** per gross.

CITRATE OF IRON & QUININE

(BRITISH PHARMACOPŒIA).

Special quotations on application.

The great success which has attended our manufacture of this preparation (amounting to about **130,000** ounces annually) has induced unscrupulous adventurers to offer, under cover of a seal and label similar to ours, an inferior preparation. We, therefore, give here a *fac simile* of our seal (in red wax) and label, and caution our friends to beware of spurious imitations of our preparation, some having been sold which contained no quinine at all.—See *Pharmaceutical Journal*, April, 1877.

EXTRACT OF MALT. Prepared in Vacuo.

In ½-lb. white glass bottles, with white-metal screw tops, **8/** doz.; do., **1**-lb. bottles, **12/6**.

QUININE WINE.

Prepared with Pure Quinine and the Finest Orange Wine, guaranteed to be of the full strength of the British Pharmacopœia.

Imperial Pints, **16/8** per doz.; Imperial Half-Pints, **8/6** per doz.

QUININE AND IRON TONIC.

In bottles to retail at **1/** and **2/** each; **7/8** and **14/** per doz.

From our position as Manufacturers of Citrate of Iron and Quinine, &c., we are able to offer advantages in this Preparation which the Retailer cannot otherwise obtain. OUR TONIC remains permanently bright, is elegantly got up, and its sale is certain.

CITRATE OF MAGNESIA.

Having Special Plant for the manufacture of Granular Preparations we can offer these advantageously.

EXTRA QUALITY.

Per lb. in **7**-lb. pottles, tins, or casks, **1/1**; **1** cwt, **1/**. Packages charged. In **1/** boxwood top bottles, **4 9** per doz. In ¼-lb. bottles, **5 4** doz.; ½-lb. bottles, **8/** doz.; 1-lb. bottles, **15/** doz., bottles included.

CITRATE OF MAGNESIA.

GOOD QUALITY.

Per lb. in **7**-lb. pottles, tins, or casks, **11½***d.*; **1** cwt., **10½***d.* Packages charged. In **1/** boxwood top bottles, **4/4** per doz. In ¼-lb. bottles, **5** doz.; ½-lb. bottles, **7/6** doz.; 1-lb. bottles, **13/** doz. bottles included.

COD-LIVER OIL, PURE NORWEGIAN.

Guaranteed to remain bright at freezing point. Extracted by a Special Process from selected Livers of the Cod Fish only.

8-oz. bottles, **9/**; 16-oz. bottles, **17/6**; 32-oz. bottles, **32/**; gallon, **13/**; 25-gallon orig. casks, **12/6** gallon.

BISHOP'S
GRANULAR EFFERVESCENT SALTS

Established 1857.

The LANCET, writing of Bishop's Preparations, says:—"Their excellence is well known."
The BRITISH MEDICAL JOURNAL says:—"The name of Mr. Bishop is a sufficient guarantee that the article is skilfully prepared."

BISHOP'S
Granular Effervescent Citrate of Caffeine.

THE BEST KNOWN REMEDY FOR HEADACHE.

This Salt has been most extensively used as a remedy for sick headache, and with such great success, that it may almost be called a specific. It relieves all disorders of nerve-function, and is at the same time most cooling and refreshing.

BISHOP'S GRANULAR EFFERVESCENT CITRATE OF CAFFEINE is sold in bottles at 2*s.* 6*d.* each. With each bottle is supplied a wooden Measure Cup, which when filled, but not heaped, gives an exact dose. The Granular Effervescent Citrate of Caffeine should be taken at the commencement of an attack of headache, and the dose should be repeated in an hour if any pain should remain. Testimonials from the most eminent medical men in the profession enclosed with each bottle.

An eminent Birmingham Physician writes:—"I like the EFFERVESCENT CITRATE OF CAFFEINE prepared by Bishop very much. It is a particularly valuable medicine as a morning restorative; and after brain exhaustion, or where sedentary occupation have reduced the tone of the system, it may be taken with perfect safety and great advantage."

BISHOP'S
Granular Effervescent Citrate of Potash.

Contains eight grains of this anti-febrile salt in each drachm, keeps well, and yields a delicious effervescent draught. It is more efficient, more economical, and more convenient than the ordinary alkaline waters, and much superior to the various mixed powders, which consist mainly of Tartrate of Soda.

The late Mr. Fewtrell, Analytical Chemist, wrote:—"It is the nicest effervescing preparation I have ever tasted, and is infinitely pleasanter than the bottled waters."

Dr. G. O. DREWRY, in his "Common Sense Management of the Stomach," recommends for Indigestion, Constipation, &c., the "GRANULAR EFFERVESCENT CITRATE OF POTASH" as a very agreeable, mild, and cooling laxative, when taken in doses of one dessertspoonful in half-a-pint of water before breakfast.

BISHOP'S
Granular Effervescent Mineral Water Salts.

For the preparation of artificial waters, these Granular Effervescent Salts are especially suitable. They give a refreshing draught, and may be relied on as presenting at the same time the chemical ingredients of the natural waters. It is obvious that in this form the Granular Effervescent preparations present many advantages over the waters themselves. Whilst all the constituents of the natural springs are reproduced, the Salts are extremely portable, more economical, and with them a sparkling refreshing draught is procurable in any quantity at any time. Among the Mineral Water Salts thus prepared may be named, CARLSBAD, KISSINGEN, PULLNA, SELTZER, VICHY, LITHIA, FRIEDRICHSHALL, &c., &c. In each case a teaspoonful of the Salt in half-a-tumbler of water will produce a draught similar in effect to the natural water. The Seltzer Water has been long recognized, both in this country and in Europe, as an excellent tonic and mild aperient.

BISHOP'S
Granular Effervescent Citrate of Magnesia.

A perfectly white and delicately clean preparation, prepared from Salts obtained from the Pure Fruit Juices of Lemons and Grapes.

The best Chemists in Great Britain and the Colonies keep no other "Granular Effervescent Citrate of Magnesia" than "Bishop's." The reason for this universal preference is that, since its introduction in 1857, it has been found that none of the Imitations of this preparation, *originally introduced by Mr. Bishop*, have been able to compare with it in reliability as a medicine, or in *purity* and *freshness of flavour* as a *cooling drink*. Full directions on each bottle.

Sold in convenient sizes to suit the Buyer.

Report on Mr. Bishop's Granular Effervescent Preparations. By Prof. Attfield, Ph.D., F.R.S., F.I.C., F.C.S., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, Author of a Manual on General Medical and Pharmaceutical Chemistry.

Mr. Bishop's Granular Effervescent Preparations have been known to me for more than twenty years. The maker has submitted to me the formulæ for them; I have seen them compounded at his factory; I have more than once tested the materials he uses; I have many times analysed the finished products. The formulæ are excellent, the ingredients pure, the processes perfect, the products all that can be desired.

(Signed)

JOHN ATTFIELD.

London, Dec. 6, 1881.

Observe the Name on the Seal, the Registered Trade Mark on the Label, and full address of

ALFRED BISHOP, *Manufacturing Chymist,*
17, SPECK'S FIELDS, Mile End New Town, London.

Messrs. JOHN WYETH & BROTHER are Sole Agents in the United States for Mr. Bishop's Preparations, and keep Stock of all the above Products.

SQUIRE'S CHEMICAL FOOD

[*Syrup. Ferri Phosph. Comp. (Squire).*]

History. This agreeable preparation was originally introduced by the late Professor EDWARD PARRISH, about the middle of the present century; he subsequently much improved his original formula.

In its present perfected form the sole right of manufacture has been acquired by Messrs. SQUIRE, who have for many years acted as Professor PARRISH'S Agent in this country.

Properties. It is a complex solution of IRON, LIME, SODA, and POTASH, in a PHOSPHORIC SYRUP (*containing the Iron in the Ferrous condition*). It thus contains no single substance which is not a constituent of the blood and tissues, and therefore may be administered daily for a lengthened period.

Uses. Physicians have prescribed it for the last twenty years more extensively than any other preparation of the kind. They have found it useful in a great variety of maladies, and especially suitable as an addition to the diet of delicate children, and in all cases of pallor and general weakness in adults as well as children.

SQUIRE,

Chemist on the Establishment in Ordinary to the Queen

413, OXFORD STREET, LONDON.

COX'S TASTELESS PILLS

BY ROYAL LETTERS PATENT,

Dated and Sealed April 13th, 1854.

Surgeons and Chemists supplied with an excellent Aperient Pill (the formula for which will be forwarded) covered with a thin non-metallic film, rendering each Pill perfectly tasteless, at 1*s.* a gross. Postage free.

Any formulæ dispensed and covered, and samples, with list of pills, from 500 different forms, which are kept in stock, will be forwarded free on application.

They were introduced to the medical profession by the present proprietors a quarter of a century ago, and many thousands of unsolicited testimonials have been received from the highest medical authorities. These Pills are now used, and have been used for many years past, by the largest and best conducted hospitals and dispensaries. Of course, a success like this has led to many imitations, and highly-varnished pills, made to resemble ours, have been introduced by some unscrupulous people. Many of these pills pass through the stomach unaltered, and a useful invention is thus likely to be brought into disrepute.

The most impudent assertions are made by some of these people, who combine, in one incongruous whole, the trades of druggists' sundrymen, retail druggists, soap-makers, and horse and cattle medicine vendors.

We make and sell nothing but pills, and have testimonials from regular customers, residing in China, Australia, and every part of the civilised world, as well as from friends in almost every town and village in the kingdom; and our trade, which is constantly increasing, is perhaps four or five times as large as all the rest of our copyists put together.

The following are some of our Prices FOR CHEMISTS ONLY:

We strongly recommend our Aperient Pills as a good general saleable Pill. These, with the Pharmacopœia Pills quoted below, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1*d.* in the Shilling will be allowed if Stamps or P.O.O. are remitted with order.

Our Pills can also be obtained from any Wholesale Druggist. In ordering, please specify "COX'S TASTELESS PILLS."

QUOTATIONS FOR OTHER PILLS ON APPLICATION.

No. in Catalogue	Pil. Aperiens et Cathartic.	Prices per Pound in Four or Five Grain Pills.	
		Coated.	Uncoated.
1 & 2	PIL. APER. (COX) C. CAL.....	6/	5/
3 & 4	,, ,, (COX) SINE CAL....	6/	5/
193	,, CATHARTIC FORT. (COX).	6/	5/
332	,, COCHIA.....	5/	4/
	Pills of the British Pharmacopœia.		
6	Pil. Alocs Barb.....	6/	5/
8	,, ,, et Asafœtidæ	5/	4/
9	,, ,, et Ferri.....	5/	4/
10	,, ,, et Myrrh	12/	11/
7	,, ,, Soc.	6/6	5/6

No. in Catalogue	Pills of the British Pharmacopœia.	Prices per Pound in Four or Five Grain Pills.	
		Coated.	Uncoated
122	Pil. Asafœtidæ Co.	6/6	5/6
66	,, Cambog. Co.	6/	5/
24	,, Coloc. Co.	16/	15/
30	,, ,, et Hyos	13/	12/
62	,, Ferri Carb.....	5/	4/
71	,, Hydrarg.....	5/	4/
92	,, ,, Subchlor. Co.	6/6	5/6
77	,, Ipecac. c. Scilla.....	7/	6/
90	,, Plumbi c. Opio.	12/	11/
104	,, Rhei Co.	7/	6/
119	,, Saponis Co.....	12/	11
321	,, Scammon. Co.	22/	21/
115	,, Scillæ Co.	5/	4

The Registrar of Trade Marks (after giving the usual public notice, prescribed by Parliament, to allow of opposition) has granted us the above "Trade Mark," thus officially recognising us as the "*Original Makers of Tasteless Pills*," and no Pills will be sent out without this Mark on all bottles or packages.

ARTHUR H. COX & CO.

Tasteless Pill Manufacturers,

ST. MARTIN'S PLACE, BRIGHTON.

"CARNRICK'S"
BEEF PEPTONOIDS

A Concentrated Powdered Extract of Beef, partially Digested and Combined with an Equal Portion of Gluten.

USED WITH SO MUCH BENEFIT IN THE CASE OF THE LATE PRESIDENT GARFIELD.

Medical Reports.

DIABETES.

"St. Paul, Minn., *September* 29, 1883.

"Gentlemen,—As a food at once nutritious, concentrated, easy of assimilation and free from amylaceous constituents, *Beef Peptonoids* suggested itself to me in the treatment of *Diabetes*. I have used it in four cases of this malady, and as an adjunct to therapeutic measures, it has proven itself eminently satisfactory.

"The resources of the physician are often sorely taxed in treating diabetes, to provide a food rich in albuminous constituents and free from amylaceous principles.

"Talbot Jones, M.D.,
"Prof. Physiology, Minn. Coll. Hospital."

TYPHOID FEVER.

"Plainfield, N.J.

"Gentlemen,—It affords me pleasure to contribute another to the many well-earned testimonials of your Beef Peptonoids. I have used it with excellent results in many cases, but one especially is at present prominent in my mind. A lad of sixteen had just passed through a twenty-eight day *typhoid fever*, when his stomach refused all the ordinary nutriments—beef tea, milk, &c.—and I was compelled at the very beginning of convalescence to put him on Beef Peptonoids. It agreed with him so nicely, and his improvement was so satisfactory, that it was continued for two weeks, during which time he received no other nourishment whatever. I was thus afforded an excellent opportunity of testing its merits, and I do certainly consider it, *without any exception*, the very best form of nutrition for convalescent patients that modern science has yet produced for us. "J. T. Fritts, M.D."

ULCER OF STOMACH.

St. Louis, Mo., Sept. 8, 1883.

"Gentlemen,—Thanks for your sample of Beef Peptonoids. I have used it before, and can say I am more than pleased with it. In a case of *ulcer of stomach* which I treated here lately, it was the only article my patient would retain, and then I used it after several other preparations had failed. "T. Friedman, M.D.

"Demonstrator of Chemistry, St. Louis Med. Coll., St. Louis, Mo."

WASTING DISEASES.

"Cincinnati, May 29th, 1883.

"Gentlemen,—I am treating several cases of *wasting diseases* by rectal alimentation, and the only remedy upon which I can rely at all is your Peptonoids. I have been waiting for some years for some one to produce an article like this, and if you will keep the Peptonoids up to the standard, shall continue to use it on every suitable occasion. "J. T. Drake, M.D."

VOMITING (PREGNANCY).

"Stirling, N.Y., Jan. 15, 1883.

"Gentlemen,—I wanted the Beef Peptonoids for a case of excessive and persistent *vomiting of pregnancy*. I used the remedy per rectum. Soon after beginning on the first sample the vomiting grew less, and by the time that and about two-thirds of the second had been used, the patient's stomach became tolerant of food, and the vomiting ceased almost entirely. Patient continues to improve.

"Dr. V. H. MacKnight."

"Hamilton, Ohio, Sept. 15, 1883.

"Gentlemen,—I am pleased with the preparation of *Beef Peptonoids*. It is *par excellence* a self-digesting nutrient. In view of its qualities in this particular, I have given it in various cases of poor nutrition, dependent upon defective digestive power, with marked success. It is one of the most eligible remedies in the *stomach trouble* of *pregnancy* that I have ever met.

"C. A. Lee Reed, M.D.,
"Prof. Obstetrics and Gynæcology,
Cincinnati Coll. Med. and Surgery."

HÆMORRHAGES.

"Whitehall, Wis., March 14th, 1883.

"Gentlemen,—Your Beef Peptonoids is the best thing I have yet found for a *weak stomach*, being retained and assimilated when other food was rejected; and my patients relish it. I find it especially beneficial for *consumption* and after *exhausting hæmorrhages*. I have not used it much in other cases yet.

"F. W. Lester, M.D."

FEVERS AND DYSPEPSIA.

"Indianapolis, Ind., Sept. 8, 1883.

"Gentlemen,—For several months I have prescribed *Beef Peptonoids* largely in fevers, dyspepsia, and in cases requiring rectal alimentation.

"Jno. Chambers, M.D.,
"Prof. Anatomy and Clinical Surgery,
Med. Coll., Indiana."

DIARRHŒA AND DYSENTERY.

"Nashville, Tenn., Sept. 17, 1883.

"Gentlemen,—I have found the *Beef Peptonoids* a most excellent form of concentrated food. In convalescence from continued fever, as well as in *Diarrhœa* and *Dysentery*, I have found it peculiarly valuable and advantageous.

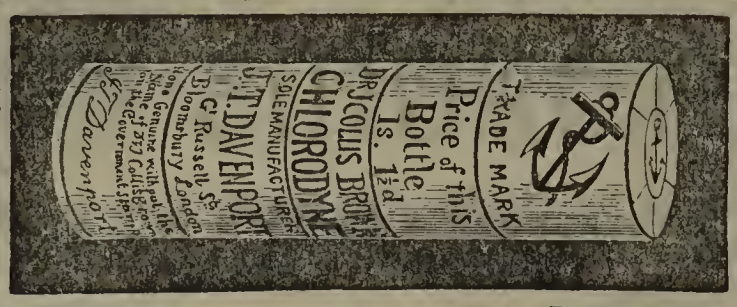
"Deering J. Roberts, M.D.,
"Prof. Practice of Medicine, University of Tenn."

The MALTINE MANUFACTURING COMPANY, Limited,

24 & 25, HART STREET, BLOOMSBURY, LONDON, W.C. 3

THE ORIGINAL AND ONLY GENUINE.

DR. J. COLLIS BROWNE'S CHLORODYNE



IS THE GREAT SPECIFIC FOR CHOLERA, DIARRHŒA, DYSENTERY.

COUGHS, COLDS, ASTHMA, BRONCHITIS.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY to denote which he coined the word CHLORODYNE. Dr. Browne is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untruc, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

GENERAL BOARD of HEALTH, London, REPORT that it ACTS as a CHARM, one dose generally sufficient. Dr. GIBBON, Army Medical Staff, Calcutta, states: "2 DOSES COMPLETELY CURED ME of DIARRHŒA."

From SYMES & Co., Pharmaceutical Chemists, Simla. *Jan.* 5, 1880.

To J. T. DAVENPORT, London.

DEAR SIR,—We congratulate you upon the widespread reputation this justly-esteemed medicine has earned for itself all over the East. As a remedy of general utility, we much question whether a better is imported, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances *ad infinitum* of the extraordinary efficacy of DR. COLLIS BROWNE'S CHLORODYNE in Diarrhœa and Dysentery, Spasms, Cramps, Neuralgia the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than Collis Browne's, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than Collis Browne's is a deliberate breach of faith on the part of the chemist to prescriber and patient alike.—We are, Sir, faithfully yours, SYMES & CO., *Members of the Pharm. Society of Great Britain, His Excellency the Viceroy's Chemists.*

DR. J. COLLIS BROWNE'S CHLORODYNE is the TRUE PALLIATIVE in NEURALGIA, GOUT, CANCER, TOOTHACHE, RHEUMATISM.

DR. J. COLLIS BROWNE'S CHLORODYNE is a liquid medicine which assuages PAIN of EVERY KIND, affords a calm, refreshing sleep WITHOUT HEADACHE, and INVIGORATES the nervous system when exhausted.

DR. J. COLLIS BROWNE'S CHLORODYNE rapidly cuts short all attacks of EPILEPSY, SPASMS, COLIC, PALPITATION, HYSTERIA.

IMPORTANT CAUTION.—The IMMENSE SALE of this REMEDY has given rise to many UNSCRUPULOUS IMITATIONS. Be careful to observe Trade Mark. Of all Chemists. 1s. 1½d., 2s. 9d., and 4s. 6d.

SOLE MANUFACTURER,
J. T. DAVENPORT, 33 Gt. Russell St., W.C.

THE ORIGINAL AND ONLY GENUINE.

IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

Apothecaries Hall	London.	Gale & Co.	London.	Morson, T., & Son,	London.
Allen, Hanbury & Co.	,,	Giles & Son,	Clifton.	Newbery & Sons,	,,
Baiss Brothers,	,,	Goulding, Messrs.	Cork.	Oldham, G., & Co.	Dublin
Banks & Richards,	Birmingham.	Grattan & Co.	Belfast.	Parsons & Richardson,	Leicester.
Barron, Harveys & Co.	London.	Grimwade, Ridley,	London.	Peake, Allen & Co.	Dublin.
Bell, John & Co.	,,	Grindley & Son,	Chester.	Raimes & Co.	Liverpool.
Corbyn & Co.	,,	Hearon, M'Culloch & Co.	London.	Sang & Barker,	Edinburgh.
Cox & Gould,	,,	Hodgkinson, Tonge & Stead,	,,	Sanger, J., & Sons,	London
Curling & Co.	,,	Hopkins & Williams,	,,	Sim, James, & Co.	Aberdeen
Davy, M'Murdo & Co.	,,	Hovenden, R. & Sons,	,,	Smeeton, W.	Leeds
Drew, Barron & Co.	,,	Johnson, J. H., & S.	Liverpool.	Southall & Co.	Birmingham.
Drew, B., & Alexander,	,,	Langton, W., & Co.	London.	Sutton, W., & Co.	London
Dunn & Company,	,,	Lynch & Co.	,,	Tomlinson, Hayward & Co.	Lincoln
Edwards, W.	,,	Mackay, John, & Co.	Edinburgh.	Treacher, Hodgkinson & Co.	London
Evans, Lescher & Webb,	,,	Mander, Weaver,	Wolverhampton.	Westwood & Hopkins,	,,
Ferris & Co.	Bristol.	Marsden & Sons,	London.	Woolley, James,	Manchester
Foulger, S., & Son	London.	Maw & Son,	,,	Wyleys & Brown,	Coventry
Frazer & Green	Glasgow.	Meggeson & Co.	,,	Yates & Co.	London

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith, unjust to patient and physician. The *value* of the remedy *alone* creates the great demand.

Sold in Bottles—1s. 1½d., 2s. 9d., 4s. 6d., and 11s. Usual Discount to the Profession.

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J. T. DAVENPORT, Pharmaceutist, 33, Gt. Russell St., Bloomsbury Sq., LONDON.

A FEW OF

S. MAW, SON & THOMPSON'S SPECIALTIES

Well worth the attention of the Trade.

SPECIAL QUOTATIONS TO WHOLESALE BUYERS.

MAW'S ARECA TOOTH PASTE	Per dozen, 4/ and 7/6.
MAW'S AROMATIC TOOTH PASTE ...	Per dozen, 12/.
MAW'S CHERRY TOOTH PASTE	Per dozen, 4/ and 7/6.
MAW'S CACHOUS AROMATISES... ...	Per dozen, 2/6.
MAW'S INDELIBLE MARKING INK ...	Per dozen, 3/ and 6/.
MAW'S SAUCE PIQUANTE	Per dozen, 9/ and 15/.
MAW'S VIOLET POWDER...	*See* Price Current, page 124.
MAW'S ADHESIVE PLASTER	*See* Price Current, page 88.
MAW'S ATMOSPHERIC ODORATORS ...	*See* Price Current, page 53.
MAW'S BREAST RELIEVERS	*See* Price Current, page 61.
MAW'S CHEST PROTECTORS	*See* Price Current, page 65.
MAW'S COURT PLASTER...	*See* Price Current, page 117.
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MAW'S ELASTIC STOCKINGS, &c. ...	*See* Price Current, page 35.
MAW'S ENEMA APPARATUS	*See* Price Current, pages 39 to 41.
MAW'S PATENT FEEDING BOTTLES ...	*See* Price Current, pages 69, 70.
MAW'S FLESH GLOVES and RUBBERS ...	*See* Price Current, page 72.
MAW'S INCORRODIBLE RESPIRATORS ...	*See* Price Current, page 47.
MAW'S INHALERS...	*See* Price Current, page 76.
MAW'S LINT (TAYLOR'S PATENT) ...	*See* Price Current, page 79.
MAW'S PERFUMERY, &c....	*See* Price Current, pages 117, 118.
MAW'S SMELLING BOTTLES	*See* Price Current, pages 95, 96.

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HOCKIN'S

EUCALYPTUS & MENTHOL PENCILS

TRADE W AND Co MARK

For the Cure of Neuralgia, Tic Doloreux, Head and Toothache.

FOR OUTWARD APPLICATION ONLY.

PRICE 5s. 3d. DOZ.; 60s. GROSS, NET.

PREPARED ONLY BY

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CLARK'S COFFEE EXTRACT.

PURE, WHOLESOME, INVIGORATING.

The Best and Cheapest. No Waste, no Chicory. Saving time and money. Made in an instant.

CLARK'S COFFEE AND CHICORY EXTRACT.

A marvel of quality and cheapness. No waste. Made in an instant.

CLARK'S EXTRACTS are in bottles to retail at 6d., 1s. and 2s., and should be sold by all Chemists, &c., throughout the world.

Clark's Extracts are made on a new and scientific principle, whereby the aroma of fresh coffee is retained unimpaired. They will keep in any climate, warm or cold, are very portable and highly concentrated, one teaspoonful of Extract making a cup of good coffee. Clark's Extracts are acknowledged by eminent and practicable judges the best in the market. Wholesale of the usual Houses and of the Manufacturers,

E. CLARK & CO.

OPTIMUS COFFEE WORKS, QUEEN'S ROAD, BATTERSEA, LONDON, S.W.

PROFITABLE AGENCY OFFERED

TO FIRST-CLASS BRITISH, COLONIAL AND FOREIGN CHEMISTS.

WHAT IS IT? WHAT IS IT?

REGISTERED TRADE MARK, No. 22,133.

"Manna Cake"

THE SUBSTITUTE FOR CASTOR OIL.

Bennette

Price to Agents, 12s. per gross.

Less 15 per cent. off cash with order, afterwards net.
,, 12½ per cent. within one month.
,, 5 per cent. within two months.

Retail 1½d. each (18s. per gross).

SUPPLIED TO ONE RETAIL CHEMIST IN EACH TOWN OR DISTRICT.

In Towns over 75,000 Population Special Arrangements will be made.
Manna Cake is highly approved of by adults and readily taken by children.

CONDITIONS OF AGENCY.—1. Perpetual Agency Guaranteed. 2. 2000 Handbills, containing Trade Mark, and with the Agent's name at foot, are sent with each gross ordered. 3. No less quantity than 1 gross will be sent out. 4. Agent to take at his own risk quantities as here given, viz.: In Great Britain, 1 gross for every 4000 population; in Ireland, 1 gross for every 6000 population, of the town or district for which he accepts. Carriage paid in England over 5 gross, Ireland over 10 gross. 5. Terms cash, or two reputed referees.

Advertisements will be continued in the Trade Journals until every Chemist feels it to his interest to stock the Manna Cake.
P.S.—There have been in all nearly 450,000 Manna Cakes ordered.

BENNETTE & COMPANY, 62, Dale Street, Liverpool.

The MANNA CAKE is sent out in Handsome Decorated Tin Boxes, suitable for display on the counter.

ROBARE'S AUREOLINE,

OR GOLDEN HAIR WASH.

The attention of the Trade is respectfully called to the above Article, now having a large sale, and giving an excellent profit to the retailer.

5/6 size	- - - - - - - -	36/- per dozen.
10/6 ,,	- - - - - - - -	72/- ,,

Sole Wholesale Agents, R. HOVENDEN & SONS, LONDON.

NOTICE TO CHEMISTS AND DRUGGISTS.

COWAN'S
VACCINATION SHIELDS

Have not been surpassed for *price*, *quality*, neatness or fit, and I warn those who are Infringing that it is a Registered Article, and I will take proceedings against any who keep making after this date, Jan. 15, 1884.

There are inferior articles in the market that are hurting the name of SHIELD,

Therefore I ask Chemists to see that it is Cowan's Shield they get, with "Registered" marked on Label.

Children's Size—3s. 3d., 7s. and 12s. per doz. Retail, 6d., 1s. and 2s. each.

Adult Size—5s. 3d., 9s. and 15s. per doz. Retail, 1s., 1s. 6d. and 2s. 6d. each.

COWAN'S
FEEDING BOTTLE POCKET.

Prices,
4s., 8s. and 12s.
per doz.

Retail,
6d., 1s. & 1s. 6d.
each.

COWAN'S
IMPROVED
Suspensory Bandages

Prices,
21s. & 12s. per
doz. in boxes.

Retail,
3s. 6d. and 2s.
each.

P.S.—My Shields have been before the Public for over six years, and during that time I have made great improvements on it for *fit* and appearance, so be sure and ask for Cowan's, for any other will hurt your sale for that article,

And oblige,
truly yours,

WM. COWAN (Inventor and Patentee of the Vaccination Shield),
51, STANHOPE STREET, GLASGOW.

CRAWSHAW'S CRYSTAL DYES

BROWN
VIOLET
MAGENTA
PUCE
CRIMSON
BLUE
MAUVE
MAROON
PURPLE
LAVENDER
ORANGE
CARDINAL
SLATE

YELLOW
CLARET
CANARY
CERISE
GREEN
GREY
PONCEAU
SCARLET
PINK
ROSE
BLACK
REVIVER

These Dyes are specially manufactured for the purpose of affording to heads of families and others the means of Dyeing at home, for a small cost, Faded Articles of Wearing Apparel, &c. Silks, Ribbons, Feathers, Woollen Goods and Stuffs of all descriptions take the Dye readily. They are easy to use; they are economical in price. The colours are beautiful and brilliant, and anything can be dyed with them in a few minutes. One Sixpenny Packet of the Crystal will go as far as six Sixpenny bottles of the ordinary Liquid Dyes. Each colour will produce any desired shade of its own colour, according to the quantity used. There is sufficient in a Sixpenny Packet to Dye a Lady's Dress, or half a dozen Children's Frocks, or 100 yards of Ribbon, &c., &c.

6d. Boxes	**Crawshaw's Crystal Dyes** In ½ gross (7 doz.) Counter Case with Glass Lid.	**48/- per gross.**
6d. Boxes	**Crawshaw's Crystal Dyes** In Boxes of 1 doz. (14) ...	**48/- per gross.**
3d. Packets	**Crawshaw's Useful Dyes** In ½ gross Cardboard Boxes ...	**21/- per gross.**
3d. Packets	**Crawshaw's Useful Dyes** Mounted on Cards of ½ gross ...	**21/- per gross.**
2d. Packets	**Crawshaw's Useful Dyes** In ½ gross Cardboard Boxes ...	**14/- per gross.**
2d. Packets	**Crawshaw's Useful Dyes** Mounted on Cards of ½ gross ...	**14/- per gross.**
1d. Packets	**Crawshaw's Useful Dyes** In 3 gross Counter Case with Glass Lid	**7/- per gross.**
1d. Packets	**Crawshaw's Useful Dyes** In ½ gross Cardboard Boxes ...	**7/- per gross.**
1d. Packets	**Crawshaw's Useful Dyes** Mounted on ½ gross Cards ...	**7/- per gross.**
The Excelsior Penny Dyes	Mounted on Cards of ½ gross each. These Dyes are Good value for the money; suitable for low-class Wholesale Trade, and where Cheap Goods are required. There is no Maker's Name on the Packets or Cards	**5/6 per gross.**
6d. Perfect Black Dye	In ¼ gross Wood Boxes	**48/- per gross.**
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SUPPLIED BY ALL THE WHOLESALE HOUSES.

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"New Lamps for Old Ones!!!"

CHEMISTS having a Stock of JUDSON'S DYES, either *soiled* or unsaleable colours, are at liberty to have them exchanged *for any other colours* they may like, provided only they return the old ones unbroken and unopened, carriage paid, to Messrs. DANIEL JUDSON & SON, who will add to the returns a very handsome small framed Show Card and a parcel of new Pamphlets for distribution; Messrs. JUDSON would of course feel *greatly obliged* if an Order for 20s. worth of *other goods* were sent at the same time, so as to cover part at least of the expense they will incur, but this is optional.

Price List (Illustrated) on application. Liberal discount for Cash.

DANIEL JUDSON & SON,
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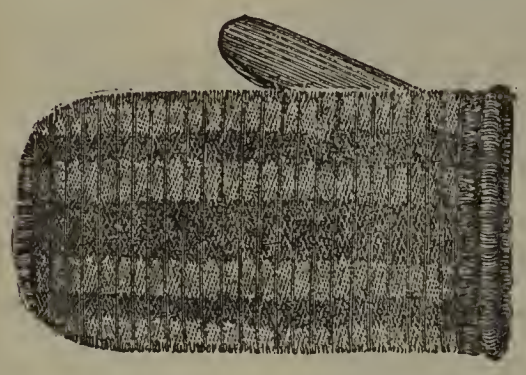
DINNEFORD'S

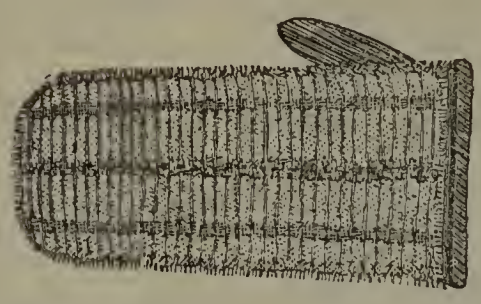
HORSE-HAIR FLESH GLOVES

BELTS, BATH BRUSHES, &c.



GENT'S FLESH GLOVE (*In Pairs*).

Best quality, in grey and black hair of various degrees of hardness. A healthy and invigorating frictor for regular daily use. A positive luxury before a shower or sponge bath. 5/ per pair, retail.

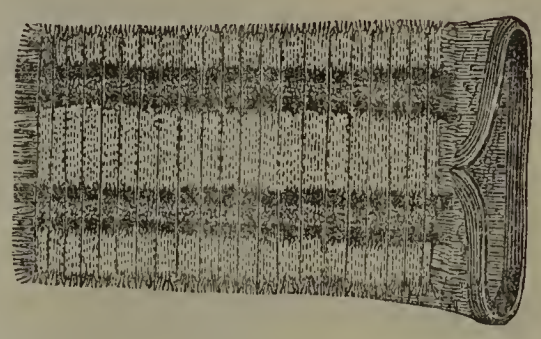


LADY'S FLESH GLOVE (*In Pairs*).

In light hair; for promoting a healthy action of the Skin. Anti-rheumatic and invigorating. 5/ per pair, retail.

CLARENDON FLESH RUBBER.

Hair on both sides. One surface is soft, the other hard; either may be used for friction. Suited to the most DELICATE skin. 3/6 each, retail.



PRINCE OF WALES BATH GLOVE.

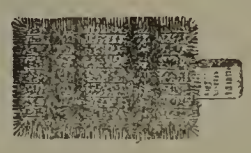
For wet or dry use. Very durable, healthful, and refreshing. A necessary addition to a Turkish or warm bath. 2/6 each, retail.

ALEXANDRA BATH BRUSH.

Hair on both sides; on a long handle. Most convenient and refreshing for the bath. 2/6 each, retail.

ARMY BATH PAD.

For wet or dry use. Hair on both sides; indispensable for the bath. Convenient and portable. 2/ each, retail.



OXFORD WASHING PAD.

For readily cleaning and softening the hands, and for the bath. 1/ each, retail.

FLESH STRAPS, OR BELTS, AND BATH STRAP.

5/ each, retail. Hair on one side. LADIES' quality, light hair and soft pile. GENTS' quality, black or grey, and pile of various degrees of hardness. Specially useful for rubbing the back, spine, and shoulders. An excellent anti-rheumatic, and very invigorating. Bath straps, for wet use.

The Dry Frictors should be used immediately after rising, and just before the shower, sponge, or plunge bath. The most delicate can in this manner enjoy the luxury of a cold bath without the risk of taking cold. A few minutes' friction at bed time will prevent that irritability which so often arises from imperfect action of the skin.

Manufactured by DINNEFORD & CO. the Original Patentees,

180, NEW BOND STREET, LONDON, W.

Award for General Excellence, International Medical and Sanitary Exhibition, 1881. Prize Medal, Paris, 1878. Medal and Diploma of Honour, Brussels, 1876.

W. & J. JAMIESON

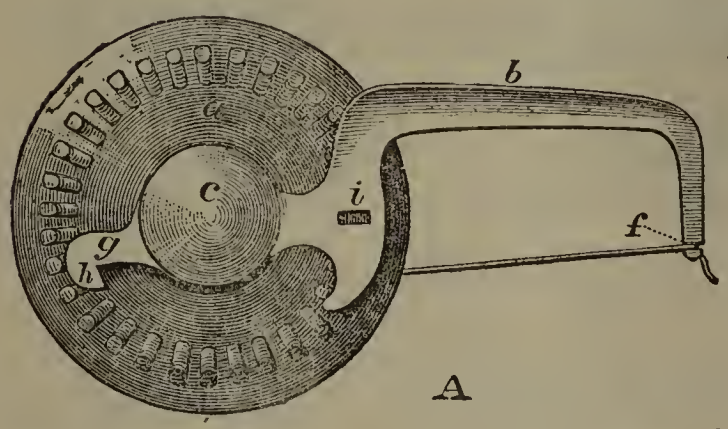
10, Broad Street, Golden Square, London, W.

MANUFACTURERS OF

DENTAL MATERIALS

DENTAL FLOSS HOLDER

TOOTHPICK SUPERSEDED.



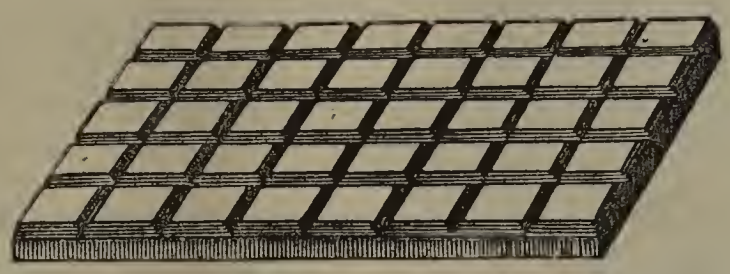
A

This is an instrument for holding and using silk floss for cleansing between the teeth. It renders this hitherto difficult and unpleasant process an easy one, and in no respect is it more objectionable than the toothpick, and it accomplishes a work that the ordinary pick cannot do. It contains from six to ten yards of floss, and is of such form as to be carried in the pocket with as little inconvenience as an ordinary tooth-pick.

36s. per dozen.

Waxed Silk, 6s., Plain Silk, 4s., per dozen Reels.

LION TOOTH TABLETS



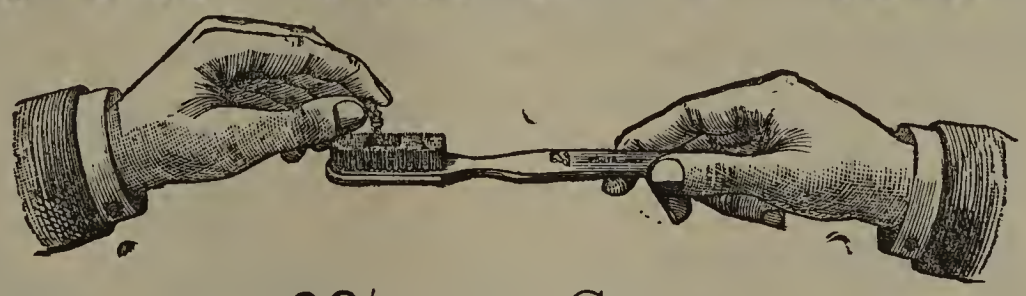
84/-

PER GROSS BOXES.

For convenience and delicacy of flavour, these Tablets have no equal as a Dentifrice. Being portable, they are especially convenient while travelling. Any number of persons can use from the same box with neatness and propriety.

TOOTH TABLET BRUSH

THIS BRUSH is especially arranged to convey the Powder to the Teeth in a cleanly and convenient manner.



DIRECTIONS.–Crush the Tablet between the thumb and forefinger over the aperture in the Brush, which conveys the Powder conveniently to the Teeth.

96/- per Gross.

Agents for Dr. J. A. ROBERTSON'S

OSSILITE WHITE FILLING

6/6 per Packet.

W. H. BAILEY & SON,

38, Oxford Street, London.

(First Prize, Silver Medal, for Trusses, 1879.)

BAILEY'S Single Circular Trusses, from 21s. per doz.
Double „ „ „ 34s. „

BAILEY'S Scrotal Trusses, Price per doz., single, 48s., double, 84s.

BAILEY'S Elastic Stockings, Knee Caps, &c.

BAILEY'S Chest Protectors,
MADE FROM THE FINEST FELT.

No.	1	2	3	4	5
Single ... ... per dozen,	7/6	9/6	11/6	14/-	20/-
Double ... ... „	17/-	22/6	28/-	34/-	45/-
Vest, to button in front ... ... „	23/-	26/6	31/6	40/-	

Children's Single, per dozen, 5/-; Double, 13/-

BAILEY'S India-Rubber Hot Water Bottles

For the Stomach and Feet, very superior to the old Tin or Earthenware articles.

	7×10	8×12	8×14	10×16.
Plain	4/-	5/9	6/3	8/- each.
Covered in imitation sealskin	5/9	7/9	8/6	11/- „

BAILEY'S Respirators

No. 1	2	3	4	5	6	7	8	9	10
8/-	14/-	21/-	21/-	30/-	30/-	42/-	42/-	50/-	72/-

BAILEY'S One Guinea Case of Respirators

In Glass Lid Box. The cheapest and best assortment, contains—

2	No. 1	at 8/-
2	No. 2	at 14/-
3	No. 3	at 21/-
1	No. 5	at 30/-
2	No. 6	at 30/-
1	No. 7	at 42/-
1	No. 8	at 42/-

One Guinea, Box included.
Usual Price without Box, 23s. 5d.

May be obtained of all Wholesale Drug Houses and Patent Medicine Vendors throughout the World. Show cards and illustrated price list free.

W. H. BAILEY & SON, 38, (late 16,) Oxford Street, London, W.

F. DARTON & CO.

MAKERS TO H.M.'S GOVERNMENT,

Estab.] **45, ST. JOHN STREET, WEST SMITHFIELD.** [1834.

Darton's Improved Imperishable Index Clinical Thermometers

As noticed in the *Lancet*, *Chemist and Druggist*, &c., can be obtained only of the Inventors and Makers; cannot get out of order, and are therefore specially suited for Export.

PLAIN CLINICAL THERMOMETERS (FAHRENHEIT OR CENTIGRADE SCALE).

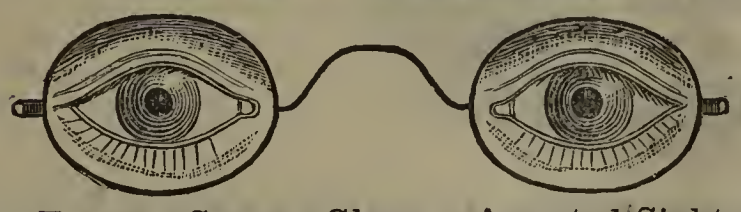
4 or 6 in., in case, 3/6 each. 4 in. or 6 in. ditto, contracted in Ebony Case, 4/ each. If with Magnified Bore, 6/ each.

DARTON'S IMPROVED DITTO, IMPERISHABLE INDEX, 4 or 5 in., 5/ each. Ditto, Enlarged and Magnified Bore, with lens front, 7/ each. Kew Certificates, 1/3 each extra.

BATH THERMOMETERS, Japanned Tin Cases, Silvered Metal Scales, 8 inches long, 12/ per dozen. Ditto Enamelled Tubes, with Dr. Forbes' Specifications, 15/6. 8-in. Boxwood ditto, with spirit tubes, 5/6 doz. Ditto, Bevelled Porcelain Scales, 18/ doz.

All kinds of Thermometers and Barometers made to Order.

SPECTACLES.



Iron Frames, Convex Glasses, Assorted Sights.
Common, 18/, 21/ and 30/ per gross. Cases for ditto, 12/ per gross.
Steel Frames—Common, 4/6 & 6/ per doz. Better Quality, 10/ per doz.
Ditto, fitted with Nentral Tint Glasses, 12/ per dozen.
Large Eye, Best Quality Frames, and Best Neutral Tint Glasses, 30/ per doz.
Ditto Light Ball-Joint Frames, 18/ per dozen.
Ditto Light Straw Frames, Grooved Glasses, 24/ per dozen.
Ditto Extra Light Frames, Best White Glasses, 36/ per dozen.
Pantoscopic ditto, with Polished Edge Glasses, 36/ per dozen.
Steel Frames, with Convex Pebbles, 27/ per dozen.
Ditto Better Quality Frames, 42/ per dozen.
Ditto Best Pebbles, 48/ per dozen.
Ditto Extra Light Frames and Best Pebbles, 60/ per dozen.
Globular Spectacles, Neutral Tint, Domed Glasses, 7 6 per dozen.
Ditto Stout English, 30/ per dozen. [48/ per dozen.
D EYE SPECTACLES, Neutral Tint Glasses, Best Quality,

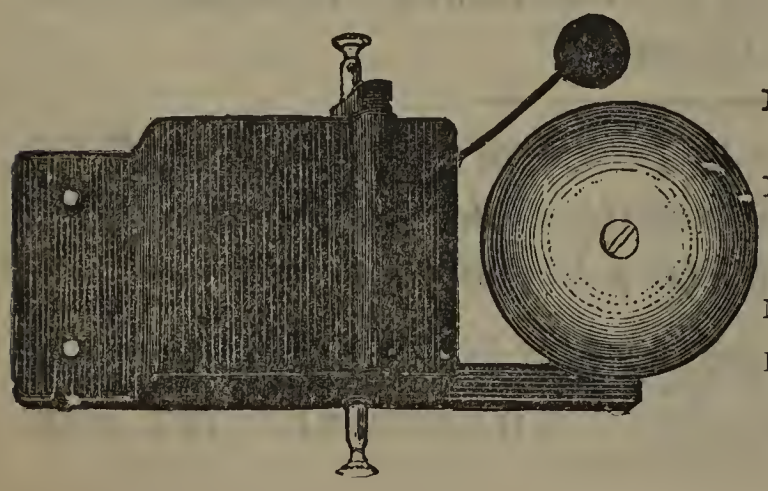
Common Steel Folders, 4/6 per dozen. Steel, 6/ and 7/6 per dozen.
Ditto Grooved Glasses. Light Frame, 15/6 per dozen.
Ditto Nickel Plated, Grooved, Extra Light, 24/ per dozen.
Ditto Best Fancy Handled, 42/ per dozen.
Nickel Plated Folders, Coloured Glass, 36/ per dozen.
Tortoiseshell ditto, Convex Glasses, 30/ per dozen. [per dozen.
New Pattern Gold Cased Japanese Folders, will wear like gold, 60/
Nickel Plated Japanese Folders, with Domed Glasses, Best Finish, Blue and Neutral Tint, 30/ per dozen.

Gold Spectacles, from 11/ per pair. Gold Folders, from 13/ per pair.
Leather Tuck Cases, 30/ per grs. Folder Cases, 14/ & 24/ per grs.
Best Morocco do., 48/ per grs. Best do., Velvet Lined, 42/ per grs.
French Frog Mouth Cases, 4/6, 6/, and 8/ per dozen.
EYE-GLASS CORDS, Black Silk, 7/6 per gross. Best Quality, 10 6 per gross. With Ball and Swivel, 24/ per gross.
UNBREAKABLE GILT CORD, 2/ per dozen yards.
AMERICAN AUTOMATIC EYE-GLASS CORDS, with Spring and Swivel, 7/6 per dozen.
*** Single articles cannot be supplied at these prices.

For the convenience of Customers who have not yet started the Sale of Spectacles, we fit up Show Cases, containing an assortment of Spectacles, complete with Sight Tester and Instructions as follows: –

Our £2 2*s*. SHOW CASE for the Counter, in Polished Mahogany, contains 4 dozen Spectacles, Sight Tester, and Instructions for suiting sight.
Our £3 3*s*. CASE contains, in addition, 2 dozen Folders and 2 dozen Cases.
Larger sized Cases, in Polished Mahogany or Ebonised, with an assortment of superior quality Spectacles, Folders, and Cases, £6 6*s*. and £10 10*s*.
Ditto, with assortment of Best Pebble Spectacles and Folders, £21

New Illustrated Price List of Spectacles and Folders, with Trade Terms, on application.



ELECTRIC BELLS.

New Form Metal Frame Electric Bell, with 2½ Plated Dome, 4/6 each. Complete, with Large Battery, Push Piece and Wire, and Instructions for Fixing, 10/6. If with best quality bell, 14/6,

Invalids' Electric Bell Set, with Bell and Battery in Polished Case, 30 feet of Flexible Line Wire, and Pear Push, 21/ each. Ditto in polished Mahogany Case, with 3-in. best bell, 27/.

Estimates given for Fitting up Houses or Shops.

Magneto Electric Machines, in Pine Case, 10/6; ditto in Mahogany, 16/6; ditto, best quality, with plated handles, &c., 22/6.
Incandescent Lamps for the Electric Light, 4/ each. Ditto with 3 Cell-Battery complete, 21/ each.

New Illustrated Price List of Electric Bells and Fittings sent Post Free on Application.

KEENE & ASHWELL'S

Homœopathic Medicines,

74, NEW BOND STREET, LONDON

Successors to Headland & Co. Established 1835.

Dimensions of Case,
9½in. high, 18½in. wide, 14in. deep.
Cost of Case alone,
£1 17s. 6d.

The Case can be Purchased Empty, and the Stock at our unusually low prices.

OUR £4 4s. AGENT'S SHOW CASE. Contents realize at retail prices £8 8s.

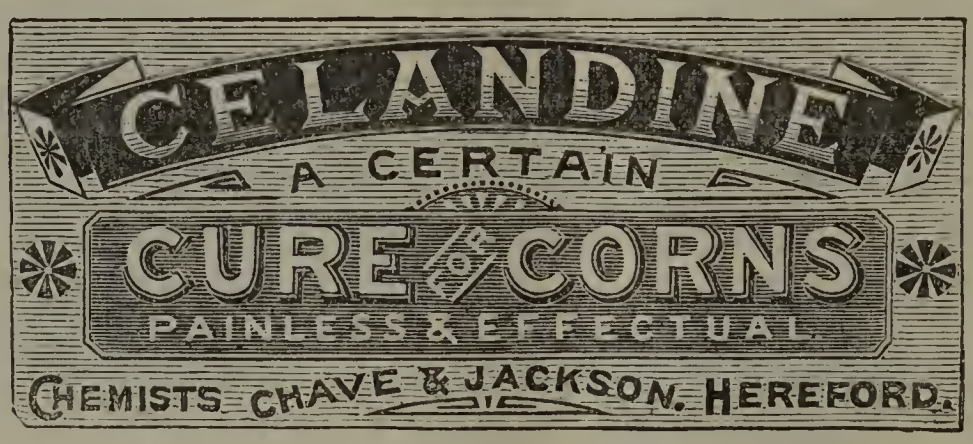
For Price Lists of other Goods and Medicines in bulk apply as above. Orders of 10s. *post free.*

10s. WORTH OF OUR MEDICINES AT WHOLESALE PRICES WILL REALIZE AT RETAIL PRICES 30s.

Avoid Imitations.

A Good Trade can be done without Risk or Competition.

REGISTERED TRADE MARK—No. 31648.



SELLS WHEREVER INTRODUCED.

See Testimonials of 200 well known Chemists.

INFRINGERS WILL] [BE PROSECUTED.

The great demand for **CELANDINE** has caused many imitations to be offered to the public. CHAVE & JACKSON hereby give notice that they will prosecute infringers.

A WARNING.

Chave & Jackson v. *E. J. Kitson.* On 24th January, *In the High Court of Justice,* Chancery Division, before Mr. Justice Kay, plaintiffs obtained a **perpetual injunction, costs,** and right of enquiry as to **damages** against the defendant for infringing their rights by the sale of an article which he termed "CELANITE."

To prevent CELANDINE getting into the hands of Stores or "Cutting Men," we supply our Agents ONLY, and we ask their assistance in maintaining FULL RETAIL PRICES, and keeping Celandine strictly a Chemist's article.

NO WHOLESALE HOUSES SUPPLIED.

AGENTS WANTED IN EVERY TOWN IN THE WORLD WHERE AGENCIES ARE NOT ALREADY ESTABLISHED.

Award of Merit—International Medical Exhibition, London, 1881.

5 Gold and Prize Medals, including one from the Academie Nationale of France.

TRADE **Maltine** MARK

A CONCENTRATED EXTRACT OF MALTED WHEAT, OATS, AND BARLEY.

The Original and **only** Preparation composed of these three cereals.

DIASTATIC VALUE, Thirty times its own weight.

A REPORT ON MALTINE.
By Professor ATTFIELD, F.R.S., F.I.C., F.C.S., &c.

I have periodically analysed the Extract of Malt termed "Maltine." In October, 1878, I was able to report that it contained, unimpaired and in a highly concentrated form, the whole of the valuable soluble materials which it was possible to extract from either malted wheat, malted oats, or malted barley. In March, 1881, I stated that no better preparation of malt had up to that time been manufactured, either as regarded strength in (*a*) the nutritive substances termed albuminoids, (*b*) the bone-forming materials known as phosphates, or (*c*) that which gives Malt Extract its chief value or digestion-compelling power—namely, diastase. I now—*October*, 1883—find that its makers have succeeded in so increasing its strength in *diastase* that it contains from three to five times as much of that substance as *any extract* of malt in the market. It digests five times its weight of starch in ten minutes, ten times its weight in twenty-five minutes, and thirty times its weight in three to four hours. Three and a half parts of phosphates and fifty-six of albuminoids are present in one thousand parts of Maltine. Its flavour and odour are those of a delicious sweetmeat.

A REPORT ON MALTINE.
By Prof. CHARLES R. C. TICHBORNE, LL.D., F.C.S., M.R.I.A., &c.

DUBLIN, Nov. 10th, 1883.

Having examined the principal unfermented Extracts of Malt in the market, I find "Maltine" is the *richest* in two of the *most important* ingredients in these foods—namely, the phosphates, or bone-formers, and that peculiar farinaceous digestive called diastase. Maltine may, in fact, be said to consist of about 80 per cent. of pure food in its most concentrated and assimilable form. This 80 per cent. may be divided as follows:—5½ per cent. of flesh formers. 74 per cent. of heat givers. 2 per cent. of bone formers. Add to this the Diastase, which imparts to it the curious power of digesting all farinaceous food outside itself, and we see in Maltine a most valuable adjunct to our invalid diet. In respect to the diastase, Maltine seems remarkably energetic, and at the temperature of the human body, one part liquefied *twenty parts of starch in two minutes*, and had completely changed or digested that body in about one hour. Some so-called Malt Extracts that I have examined do not seem to possess this property at all. It is probable that they are merely inverted sugars artificially prepared for brewing purposes. Maltine possesses all the characteristics of a cereal extract as prepared from the grain, and there can be no question about the genuineness of this preparation. It also seems to be prepared with great care. I consider it a happy idea to combine the *three most important cereals* used in human dietary. It is only necessary to consult any work upon dietetics to see that there is a considerable difference in the composition of the various grain crops. By combining these three important substances—barley, oats, and wheat—we get a food which represents the average composition of the three cereals, and that food already digested for our use, a condition of *immense value* to the physician in those special cases where the digestive functions are impaired.

A REPORT ON MALTINE.
By Dr. STEVENSON MACADAM, F.R.C.S.E., F.C.S., F.I.C., &c.

EDINBURGH, Nov. 15th, 1883.

I hereby certify that I have carefully analysed a sample of "Maltine" forwarded to me by the Maltine Manufacturing Co., Limited, London, and have contrasted the results obtained therefrom with the analyses made by me of *four other* well-known Extracts of Malt. I find that the Maltine is unusually rich in natural diastase or digestive principles, as well as in nutritive or flesh-forming and in phosphatic or bone-producing ingredients. It contains, in a condensed form, *all* the important principles present in malted grains, such as *wheat, oats, and barley;* is highly palatable, and when incorporated with articles of vegetable diet, such as bread, potatoes, &c., it rapidly assists in the digestion and solution of the farinaceous materials, so that they may be readily absorbed into the system. In all the digestive and nutritive properties, the Maltine *materially exceeds* in power and efficacy any of the other Extracts of Malt which I have analysed; and I am confident that the Maltine not only deserves the highest praise among such preparations, but that it will prove itself to be an able and successful factor in the assimilation of food, especially where the digestive functions are somewhat impaired, or are in need of tone or strengthening.

The MALTINE MANUFACTURING COMPANY, Limited,

24 & 25, HART ST., BLOOMSBURY, LONDON, W.C.

No Stable is complete without

ELLIMAN'S ROYAL EMBROCATION

For Sprains of all kinds, Curbs, and Splints.
For Over-reaches, Chapped Heels, Wind Galls.
For Rheumatism in Horses.
For Sore Throats and Influenza.

For Broken Knees, Bruises, Capped Hocks.
For Sore Shoulders, Sore Backs.
For Foot Rot and Sore Mouths in Sheep and Lambs.

SPECIMEN TESTIMONIALS.

From His Grace the Duke of Rutland, Master of Belvoir Hunt.

December 1st, 1879.

SIRS,—Elliman's Royal Embrocation is used in my stables; I think it very useful.

RUTLAND.

Wolmirstedt, Prussia.

September 20th, 1882.

I am glad to be able to tell you that for the last two years I have regularly used Elliman's Royal Embrocation with very excellent results; especially is it to be recommended for preventing and curing sore backs. I have used it in some cases for sprains of the shoulder with good results. I should also recommend it for applying to the legs of horses after a hard day's work, to give them renewed freshness. KRICHELDORFF,

Riding Master, Estate Owner, and Lieut. of the Reserve of the Altmarkischen Ulanen Regiment, Nr. 16.

From Major J. M. Browne, Master of South Staffordshire Hounds.

October 17th, 1879.

SIRS,—I find Elliman's Embrocation exceedingly good for sprains and cuts in horses, and also for cuts in hounds' feet. I shall strongly recommend it to all my friends.

Yours faithfully, J. M. BROWNE.

From Lieut.-Col. R. H. Price, Master of Radnorshire Hunt.

December, 1878.

GENTLEMEN,—I use the Royal Embrocation in the stables and kennels, and have found it very serviceable. I have also used the Universal Embrocation for Lumbago and Rheumatism for the last two years, and have suffered very little since using it.

R. H. PRICE, Lieut-Col.

SHOW CARD

20 by 15, post free.

To be delivered in April.

APPLY EARLY.

Sold by Chemists, in Bottles, 2s., 2s. 6d., and 3s. 6d. Prepared by ELLIMAN, SONS & CO., SLOUGH.

RHEUMATISM, SPRAINS, CHEST COLDS, &c.

ELLIMAN'S UNIVERSAL EMBROCATION.

Often wanted in the Household. It is a certain cure. Simple in application. Sold everywhere.

ELLIMAN'S UNIVERSAL EMBROCATION

For Sore Throats and Colds at the Chest.
For Rheumatism and Lumbago.
For Strains, Sprains, and Bruises.
For Chaps and Chilblains before broken.

To replace the Mustard Plaster.

Sold by all Chemists, in Bottles, 1s. 1½d. and 2s. 9d. Prepared by ELLIMAN, SONS & CO., SLOUGH.

"THE MONTH."

It is extraordinary that, notwithstanding, the electric light has now found wide application for a considerable time, so litle unimpeachable information is available as regards its cost as compared with that of gas. One of the most useful contributions upon the subject was a letter sent to the *Times* at the beginning of last year by Mr. O. E. Coope (*Pharm. Journ.*, [3], xiii., 602), in which he gave his experience in lighting Berechurch Hall by electricity with Swan incandescent lamps during the few preceding months. This he has now supplemented by a second letter (*Times*, Jan. 29) giving his experience for another twelve months. He reports that during the whole of this time there has been no mishap of any kind, with the exception of the belt slipping three times, which caused five minutes' delay at the outside. The lights have been found steadier than gas, and the lamps instead of being 18-candle power, as when started, are now working up to 20-candle power. There are two hundred of these lamps in use and the renewals numbered three hundred during the twelve months, in which the actual working hours of the lights amounted to 1823. The expenditure, including 10 per cent. of cost for depreciation of machinery and 5 per cent. for depreciation of conductors, amounted to £232 15*s.* 1*d.*, or nearly one farthing (0·9 of a farthing), per 18-candle lamp per hour. Mr. Coope says that another year's experience enables him to reassert most emphatically what he said last year as to the advantages of the incandescent lamp. He recommends that the plan of massing the lamps in electroliers should not be adopted in lighting dwelling houses, but that the lamps should be rather kept as far as possible apart. A Mr. Bower, writing to the *Times* subsequently, gives data to show that the same amount of effective light could have been obtained by burning coal gas, estimated to have been produced for 3*s.* 5*d.* per 1000 cubic feet, at a cost of one-sixth of a penny per light per hour.

Under the rather questionable caption of "Sound Mills," which recalls to the memory some of the fabulous rumours that got abroad when Mr. Crookes first described the radiometer, Professor Silvanus Thompson has given an interesting account (*Nature*, Feb. 13) of some apparatus designed by Dr. Dvorák to demonstrate the influence of sound waves in a manner analogous to that in which the radiometer marks the effect of light waves. One of these "sound mills" consists of four light hollow spherical glass resonators, suspended from the extremities of the arms of a light wooden cross, balanced on a needle point; the balls, which are 4·4 cms. in diameter, have each a slightly protuberant opening of 0·4 cm., all the openings being turned to follow in the same direction. The resonators respond to the note *g'*, and when that note is forcibly sounded by an appropriate tuning fork the air in the resonators vibrates in response, and the apparatus begins to rotate. Briefly the explanation of this action is that at all nodal points in the vibrations of the air in tubes or resonant boxes the pressure of the air is greater than elsewhere, and therefore any resonator closed at one side and open at the other is urged along bodily by the slight excess of pressure on the closed end. There are four kinds of "sound mills" described and figured in the paper.

Sir James Paget, whose interesting papers on abnormal growth of plants attracted so much notice some time since, has drawn attention in the *Medical Times* (Feb. 16, p. 206) to some remarkable investigations made by Dr. Beijerinck in connection with the formation of gum in trees, lately published by the Royal Academy of Sciences at Amsterdam. Dr. Beijerinck found that in the peach, apricot, plum, cherry, or other trees bearing stone fruits, the formation of gum may be caused by inserting a portion of the gum under the edge of a wound through the bark. The observation that heated or long-boiled pieces of gum would not produce this effect, and that wounds made in the bark of the tree did not produce gum unless a portion was first introduced into it, led him to suspect that the formation of gum was due to the presence of bacteria or other living organisms. On microscopical investigation he found that only those pieces of gum containing spores of a highly organized fungus, belonging to the *Ascomycetes*, had the power of conveying the gum disease or gummosis, and that these spores, inserted by themselves under the bark, produced the same pathological changes as did the pieces of gum. The fungus has been examined by Professor Oudemans, who has ascertained it to be a new species, and has named it *Coryneum Beijerinckii*. Its chief characters consist in the fact that it has a cushion-like stroma, composed of a bright brown parenchyma, on which stand numerous conidia having colourless, unicellular and very slender stems, about as long as themselves. The conidia are small, cask-shaped, about one-thirtieth of a millimetre in length, and usually divided by slightly constricting septa into four cells, of which the two terminal are longer than the two middle ones. From these cells germinal filaments may proceed, from which are developed yeast-(like?) cells, or brown thick-walled and many-celled mycelia. The first symptom of the gum disease is the development of a beautiful red colour around the wound due to the formation of a red pigment in one or more of the layers of the cells of the bark. Dr. Beijerinck believes that the fungus produces a fluid of the nature of a ferment, which penetrates the adjacent structures, since the disease extends beyond the parts in which any trace of the fungus can be detected. This ferment he believes to act on the cell walls, starch granules and other constituents of the cells, transforming them into gum and even changing into gum the *Coryneum* itself. The influence of this fluid is also exerted in the cambium, causing the formation of morbid parenchyma, the cells being cubical or polyhedral, thin-walled and rich in protoplasm that is in its turn transformed into gum. It is further stated that "a similar disease produces gum arabic, gum tragacanth, and probably many resins and gum resins." Gum tragacanth is known to be produced by the pith as well as the bark of the stem, and to ooze out from the pith when the stem is cut, and if it be indeed due to a disease it would seem as if the disease infects the whole plant. Gum, moreover, may be found in the uninjured husk of the almond, and it seems at first sight more probable that the irritation caused by a fungoid parasite should cause a greater flow of the natural product, just as the irritation caused by an insect causes the development of galls. Whether this be so or not, the discovery that it is possible to produce artificially a free flow of gum is a valuable discovery, since it may now be found advantageous to cultivate certain trees for the purpose. This is a point which might well attract the attention of the Forestry Department, since the im-

portations of gum arabic at the present time consist largely of a variety that gives a ropy, slightly adhesive and very unsatisfactory mucilage.

In *Nature* (January 31, p. 313) Dr. G. Schweinfurth gives an account of some new botanical discoveries made by him in connection with the mummies of the twenty-first Egyptian dynasty, found at Deri-el-Bahan. In the floral wreath on the mummy of the Princess Ugi-Khouni were found folded leaves of a willow, *Salix Safsaf*, perfect flowers of the corn poppy (*Papaver Rhœas*, var. *genuina*), flowerheads of *Centaurea depressa*, and of *Picris coronopifolia*. The flowers of *P. Rhœas* appear to have been gathered in an unopened condition to prevent the petals from falling, and are in such good condition that Dr. Schweinfurth remarks that such perfect and well-preserved specimens of this fragile flower are rarely to be met with in herbaria. It is worthy of note, too, that the character of this variety of the poppy, var. *genuina*, although gathered more than three thousand years ago, are identical with those of the same variety known at the present day. With respect to *Picris coronopifolia* the author remarks that not a single peculiarity is apparent by which it might be distinguished from the recent small form with low spreading branches now so common on the outskirts of the desert. From the occurrence of this flower in the wreaths it is possible to conjecture that the burial of the princess took place in March or April, since there would have been considerable difficulty in obtaining the flowers after the latter month. It has also been determined by capsules of the linseed plant found in a Theban tomb of the twelfth dynasty, 2200–2400 B.C., that the flax used by the ancient Egyptians was derived from *Linum humile*, Mill., and that the mustard oil used by them was derived from one of the two varieties of *Sinapis arvensis*, viz., *S. Allionii*, Jacq., or *S. turgida*, Del., both of which are still common in Egypt.

In the *Journal of Botany* for February, Mr. W. Carruthers, F.R.S., points out that the grass, *Anthoxanthum Puellii*, Lee and Lam., which has within the last few years been met with in Britain and was supposed to have been an indigenous plant hitherto overlooked, occurs only in localities which are not free from the suspicion that the plant has been introduced with agricultural seeds. This opinion receives some weight from the fact that the seed of this grass is being increasingly used by seedsmen to adulterate that of *A. odoratum*. The seed of *A. Puellii* differ from that of *A. odoratum* in being enclosed in straight paleæ, entirely covering the seed, and having hairs arranged in lines along the midrib and veins along the edges, and two or three irregular teeth at the apex. The seeds also are of a paler colour than in *A. odoratum*. In the latter the two paleæ are arched, so as to allow a portion of the seed to be seen between the open edges, are everywhere clothed with hairs, and are rounded at the apex, not toothed.

The means by which the function of aeration, usually performed by lenticels, is carried on in those climbing shrubs in which they are absent, has been recently investigated by Herr Klebahn, who finds that, in all cases which he has examined, there are a number of parallel cellular interspaces extending through the cortex, cambium, wood and medullary rays, and are thus in connection with the interspaces of the wood, forming a very efficient system of aeration for the stem.

In the leaves of *Abics pectinata* Herr Wilhelm has found a peculiar structure of the stomata, apparently intended to hinder transpiration. These openings contain a number of nearly black patches, composed of a great quantity of minute granules of the nature of wax, apparently identical with that which covers the surface of the leaves. They are present in the stomata at all times of the year.

The root hairs of plants have formed the subject of an exhaustive study by F. Schwarz, with regard to the morphological and physiological relations. He finds that the increase of absorptive surface presented by the presence of these hairs as compared with that of naked roots is from 5·5 to 18·7. Their development is interfered with either by too much or by too little moisture; too little causing a local increase, and too much causing a general decrease in the amount of root hairs formed. In some experiments made by J. Vesque on the oleander and garden bean, it was found that the absorption of water by the roots of these plants increased in the case of the former in proportion to the atmospheric pressure, osmose not always appearing to be very active, since when the atmospheric pressure was reduced to about 60 c.m. of water, absorption was arrested.

Observations made by V. Marcona on the movements of the sap in plants in the tropics indicated that in the plants examined, viz., *Carica Papaya* and a liana, there are two periods of maximum rapidity in the twenty-four hours, one between 8 and 10.15 a.m., and the other between 1 and 3 p.m., the rapidity in the latter being less than in the former and sinking gradually to zero, the activity commencing again after sunrise.

W. Detmer regards the organic acids as being the chief promoters of osmose, and consequently of the turgidity of the cell; the conversion of starch into sugar being also largely dependent on the presence or absence of free acids, small quantities of hydrochloric, nitric, phosphoric, acetic and oxalic acid promoting this conversion in a remarkable manner. He has also found that no transforming ferment can be formed in the cells of higher plants in the absence of oxygen. This fact may throw some light on the formation of gum more readily where trees are wounded.

The commercial samples of liquid starch sugar, or "glucose," examined by the Committee appointed in the United States to investigate the subject of starch sugar, to which reference was made recently, were found to contain from 34·3 to 42·8 per cent. of dextrose, 0 to 19·3 per cent. of maltose, 29·8 to 45·3 per cent. of dextrin, and 14·2 to 22·6 per cent. of water. The samples in the solid form—"grape sugar"—ranged in composition from 72 to 73·4 per cent. of dextrose, 0 to 36 per cent. of maltose, 4·2 to 9·1 per cent. of dextrin, and 14 to 17·6 per cent. of water. Three specially prepared samples of "grape sugar" contained respectively 87·1, 93·2 and 99·4 per cent. of dextrose, the last being "crystalline anhydrous dextrose." The ash in the "glucoses" varied between 0·325 and 1 per cent., and in the "grape sugars" between 0·335 to 0·75 per cent. The reporters add that in the United States starch sugar is chiefly used in making table syrup and artificial honey, in brewing and vinegar making, as well as in the adulteration of cane sugar and as a substitute for it in confectionery and canning fruits. It is estimated by the Committee that the industry in the United States gives employment to twenty-

nine factories, which together represent a capital of one million sterling, consume about forty thousand bushels of maize daily, and produce "glucose" and "grape sugar" to the value annually of two million pounds.

At the Pharmaceutical Meeting in Philadelphia on January 15, Professor Maisch exhibited a root called cinnamon root, which was said to be used in Europe for the purpose of adulterating powdered cinnamon. The root had a flavour of cinnamon and cloves. Dr. A. W. Miller stated that in the neighbouring city of Camden there was a factory for roasting and grinding cocoa nut shells, the powder of which was used for adulterating spices; it sells at $2\frac{1}{2}$ cents per lb., and enables the fraudulent operator to dilute the spice and obtain large profits (*Amer. Journ. Pharm.*, Feb., p. 124).

Hyoscine, the second henbane alkaloid, which about three years since (*Pharm. Journ.*, [3], xi., 351) was isolated by Herr Ladenburg from residues from the preparation of hyoscyamine, has been further investigated by the same chemist (*Berichte*, xvii., 151). He has confirmed his previous experiment that when hyoscine is treated with alkalies it splits up, like atropine, into an acid and a base, the acid being identical with tropic acid, but the base being only isomeric with tropine (pseudotropine). The identity of the acid was proved by combining it with tropine, under the influence of hydrochloric acid, to form atropine. All attempts however to regenerate hyoscine by recombining the tropic acid and pseudotropine were without result. Pseudotropine is described as crystallizing in rhombohedra, and being less hygroscopic than tropine, but soluble, like it, readily in water and chloroform and less freely in ether. It melts at 106° C., and boils between 241° and 243°. By treatment with hydrochloric or sulphuric acid a new base can be obtained from pseudotropine, which is isomeric with tropidine.

"Belladonnine" is another little-known solanaceous alkaloidal substance that has been investigated by Herr Ladenburg. The name was originally given by Herr Hubschmann to a basic substance noticed in belladonna root, and the subject was afterwards investigated by Herr Kraut, who left the decision as to its composition unsettled. The question has therefore been taken up by Herr Ladenburg (*Berichte*, xvii., 152), working upon material supplied by Messrs. Gehe. This consisted of a brown, viscous, semi-solid mass, obtained from the mother liquor of atropine sulphate, and agreed in its characters with the substance examined by Herr Kraut. It was only slightly attacked when heated with baryta, but went completly into solution when boiled with alkalies. The alkaline solution gave up to chloroform or ether a basic mixture, one part of which consisted of tropine, and the other of a strong base which was at first thought to resemble pseudotropine, but which on analysis was found to be oxytropine. The acid products of the decomposition proved to be tropic acid and its derivatives, atropic and isatropic acids. It is therefore thought probable that the substance used in the investigation was a mixture of atropine with oxyatropine. Herr Ladenburg proposes to revert to the subject of belladonnine in a future paper.

Another interesting step towards effecting the complete synthesis of alkaloids has been taken by Herr Ladenburg in the conversion of pyridine into piperidine (*Berichte*, xvii., 156). The reverse operation, the conversion of piperidine into pyridine, had already been effected by Professor A. W. Hofmann and others, whilst Herr Ladenburg had obtained a similar result with tropidine (*Pharm. Journ.* [3], xii., 1049). Herr Ladenburg had therefore proposed to work upwards from pyridine, through piperidine, to hyoscyamine, but hitherto all attempts to hydrogenate pyridine by the usual agents had failed. This has now, however, been accomplished and piperidine has been obtained by the action of sodium upon an alcoholic solution of pyridine. It is also hoped that homologues of piperidine may be obtained by similar treatment of the other tar bases.

Reference has already been made in these columns to the divergent opinions expressed by different investigators with respect to the nature of picrotoxin (*Pharm. Journ.*, [3], xi., 352, 897). It will be remembered that, according to Messrs. Barth and Kretschy, ordinary picrotoxin would consist of a mixture of three distinct bodies, separable by fractional crystallization from benzol and water, which they proposed to call "picrotoxin," "picrotin," and "anamirtin," and that Messrs. Schmidt and Löwenhardt considered two of these bodies at least to be products of decomposition resulting from the action of the hot solvent. Herr Schmidt has now published (*Annalen*, ccxxii., 313) the results of a further investigation which are quite confirmatory as to the homogeneity of picrotoxin. Samples prepared by himself, and others obtained commercially and purified by repeated recrystallization from strong alcohol and water, were found to consist of colourless stellate crystals, having uniformly a composition represented by the formula $C_{30}H_{34}O_{13}$ and a constant melting point of 199–200° C. This product was, however, easily decomposed by hot benzol, or even by chloroform at the ordinary temperature, into two other bodies which he calls "picrotoxinin" and "picrotin." The melting point of a mixture of these bodies is, however, not uniform, since although it commences to fuse at 200° C., it does not completely melt before 210° to 230° C. The decomposition is represented by the equation:—

$$\underset{\text{Picrotoxin.}}{C_{30}H_{34}O_{13}} = \underset{\text{Picrotoxinin.}}{C_{15}H_{16}O_6} + \underset{\text{Picrotin.}}{C_{15}H_{18}O_7}$$

Picrotoxinin melts at 201° C., is bitter and poisonous; whilst picrotin melts at 255°–256° C., and is bitter and non-poisonous.

The well-known red coloration of carbolic acid has been the subject of a number of theories and assertions, but none put forward yet has enabled the manufacturers to overcome the difficulty, which frequently involves them in considerable loss. The *Pharmaceutische Post* (Feb. 2 and 6, pp. 101 and 131), contains an account of the results of a large number of experiments, which, as they promise to be of some practical use, may be briefly summarized. It was found that English crystallized crude carbolic acid contained certain volatile and colourless substances, which under the influence of light, and to a less degree of warmth and air, were converted into red and yellow-brown non-volatile compounds, and that of these compounds that which afterwards became red passed over in distillation with the first portion of the carbolic acid, and that which became yellow-brown with the last. In a fractional crystallization these colour-yielding compounds did not form part of the carbolic acid crystals, except to the extent that they were enclosed mechanically, but were concentrated in the mother liquor. They

were only slightly soluble in cold water, and insoluble in benzin, but could be readily extracted from a solution by means of water acidulated with sulphuric or phosphoric acid. Contact with oxidizing agents during the distillation appeared to affect the compounds only partially. But in aqueous solution in the presence of free sulphuric acid oxidizing agents attacked both the colour-yielding compounds; the resulting oxidation products appeared to be more easily soluble in water than the original substances, whilst they had lost their volatility or passed over in small quantity only with the last portions of the acid. Referring to the theory that the colour is attributable to lead derived from the glass vessels used in the distillation of the acid, it is stated that no metal could be detected even in strongly coloured glass-distilled samples of carbolic acid.

The unpleasant consequences that sometimes follow the inhalation of an atmosphere charged with emanations from freshly painted surfaces are well recognized. The *Lancet* (Feb. 16, p. 313) appears to be disposed to attribute these to the action of some volatile compound of lead, notwithstanding that lead compounds are supposed to be non-volatile, and that the inconveniences are by no means confined to lead paints. The observation, however, upon which the *Lancet* bases this conclusion is sufficiently curious to be worth further investigation, it being to the effect that luminous paint, the basis of which is calcium sulphide, when unprotected is found to be perceptibly blackened by the fumes from fresh lead paint in its vicinity.

An interesting note upon the preparation of ferric ethylate and the separation from it of a colloidal ferric hydrate has been forwarded to the French Academy by M. Grimaux (*Comptes Rendus*, xcviii., 105). He states that when a molecule of ferric chloride dissolved in absolute alcohol is allowed to react upon six molecules of sodium ethylate, there is an immediate precipitation of sodium chloride, leaving a clear very dark brown solution that no longer contains chlorine, but in which the iron is present in the state of ferric ethylate. A solution made with 3·25 grams of ferric chloride dissolved in 25 c.c. of absolute alcohol and 1·40 grams of sodium dissolved in the same weight of alcohol can be distilled in a water-bath without alteration, and leaves as a residue a black pasty mass, soluble in absolute alcohol, benzine, chloroform, ether, petroleum and methylic alcohol. But if this residue be heated in a vacuum so as to remove all traces of the solvent there is a separation of a brown powder consisting of ferric hydrate; the small quantity of water that may be present in the alcohol or that may have been acquired during the manipulation reacting upon the ferric ethylate and decomposing it almost entirely. When the alcoholic solution is exposed to the air it absorbs moisture rapidly and the ferric hydrate separates as a thick coagulum. When the solution is thrown into excess of water a clear liquid is obtained, presenting the characters of solutions of colloidal hydrate of iron described by Graham, but which coagulates spontaneously after a longer or shorter time. The coagulation takes place more rapidly the smaller the quantity of water, and is also promoted by heat. The coagulum of ferric hydrate forms a thick jelly, at first transparent and retaining by capillary affinity so much water that even in dilute solutions it occupies the entire bulk. But gradually in the cold, and more rapidly when heated, the jelly contracts, the water separating and forming a kind of supernatant serum, the phenomena resembling in many respects those observed in the coagulation of blood.

The alteration in the blood caused by the administration of nitrite of sodium has recently been the object of spectroscopic investigation by M. Hénocque, who has made known his results to the Société de Biologie (*Medical Times*, Feb. 9, p. 197). He finds that under the influence of this drug hæmoglobin temporarily loses its power of absorbing oxygen and becoming converted into oxyhæmoglobin. He considers the action to resemble the asphyxia caused by carbonic acid rather than that resulting from carbonic oxide, since the effect gradually passes off and the corpuscles ultimately regain their normal functions.

Dr. T. M. Dolan, in the *British Medical Journal* (Feb. 9, p. 261), recommends sulphide of calcium in solution as a satisfactory lotion in scabies, and much superior to sulphur ointment, it being more easy of application, cleanly and speedy in its action. The mode of application is to give a warm bath, paint the patient's body with the lotion, and when the itching has ceased give another warm bath. The lotion is made by boiling together flowers of sulphur, 100 parts; quicklime, 200 parts; water, 1000 parts. The clear solution is preserved in hermetically-sealed bottles.

Paraldehyde does not appear to be received with much favour at the present time. Dr. J. C. Wilson, in the *Maryland Medical Journal*, states that he has employed it in nine cases; but that several patients complained of the disagreeable after-taste. On account of its unpleasant taste and odour it requires to be given with a considerable quantity of water. In his opinion it may form a useful addition to the ordinary hypnotics, but is not likely to supersede them. The dose he has given is one fluid drachm, but this quantity soon ceases to produce its effect and the dose soon requires to be increased (*Medical Times*, Feb. 9, p. 198).

Dr. R. Shingleton Smith, in a paper in the *British Medical Journal* (Feb. 16, p. 314), confirms the statements made by Dr. Filehne that kairine is a powerful antipyretic, and that it will reduce the temperature in from two to six hours to the normal state with perfect safety to the patient. He considers that the quickness of its action gives it a great advantage over quinine, the only disadvantage attending its use being that its effects are more evanescent than those of quinine. Dr. Smith considers that kairine is a valuable drug, which will perform quite safely, quickly, and pleasantly the office which has hitherto been effected by nothing else than the disagreeable and troublesome cold bath. Further observations recorded in the *Medical Press* (Feb. 13, p. 143) indicate, however, that kairine is not without certain disadvantages. Dr. Guttman states that patients complain very much of the taste of the drug, so much so, that it had to be given in wafer paper, whilst the course of the disease is not in the least altered by the medicine. Messrs. Colin and Zadek state that in intermittent fever especially, or the malarial form even, large doses did not cut short the attack. According to Dr. Menche, also, collapse sometimes follows its administration in typhus and pneumonia.

Dr. J. B. Mitchell in the *Lancet* (February 9, p. 283) recommends castor oil as a most satisfactory lubricant for use in the insertion of catheters, its

viscidity and tenacity causing it to adhere to the instrument where other lubricants would become removed before the bladder is reached. It does not, as might have been supposed, produce any irritation.

An illustration of the saying that "doctors differ" may be found in the pages of the *Medical Press* (Feb. 6, p. 127) under the head of "Is Lobelia a Poison?" Lobelia is generally considered by the medical profeision to be as much a poison as tobacco, when taken internally; yet in the recent trial of a medical botanist, one witness, a M.R.C.S., stated that for thirty years he had been in the daily habit of using and prescribing it, and had himself taken it in doses of 1 drachm. There can be no doubt that the drug is largely used in full doses by the followers of Skelton and Coffin, and yet comparatively few cases of poisoning occur. This is probably due to the fact that it is usually given in conjunction with large doses of cayenne pepper, and the rapid emetic effect which follows administration of the drug in this combination prevents it from being absorbed into the system. That it is a powerful drug and should only be used by those who are well acquainted with the conditions under which it may prove dangerous or fatal, is evident from the narrow escape the late Professor Palmer had from death by a large dose of the drug, although in his case it ultimately cured instead of killing him.

Professor Lustgarten is reported (*Pharm. Post*, Jan. 26, p. 86) to have made some experiments with mercurous tannate, which have shown it to surpass all other mercurial preparations for therapeutic purposes. The dose is one decigram two or three times a day.

Bromine is strongly recommended by Dr. Schiltz (*Pharm. Central.*, Feb. 14, p. 71) in the treatment of diphtheritis. One form in which he uses it is as a solution prepared from aqua chlorata, 30 parts; aqua dest., 150 parts and potass. brom., 3 parts. The bromine separated by the chlorine from the bromide of potassium remains dissolved in an excess of the latter, like iodine in potassium iodide. The standard for aqua chlorata, P.G., is lower than that for chlori liq., B.P., since it is only required to contain "at least" 0·4 per cent. of chlorine as compared with 0·6 per cent.

The physiological effects of jequirity still continue to be a subject of investigation by Messrs. Cornil and Berlioz. In a paper recently read before the Académie de Médecine they state that an injection of 10 to 20 drops of the infusion into the breast of a fowl caused rapid poisoning terminating in death, copious diarrhœa being the most marked symptom. If a small quantity only be injected local œdema and damage to the neighbouring muscle is produced, but immunity is acquired (*Lancet*, February 9, p. 267).

A new micro-organism, *Bacillus beribericus*, has been discovered in the blood of patients suffering from the disease known in the tropics as beri-beri. The organism consists of cylindrical branched filaments, with genuine joints and sometimes refracting brilliant points which are believed to be spores. The filaments cultivated after Pasteur's method and injected into rabbits have caused all the symptoms of beri-beri. M. de Lacerda believes that the parasite is originally derived from rice which has undergone a peculiar alteration (*Lancet*, Feb. 9, p. 268).

Some further particulars as to the results obtained by the Cholera Commission sent out to India by the German Government have been received from Dr. Koch, writing from Calcutta on the 17th ult. The first experience in India was that in dissecting the dead bodies of nine cholera patients, in every case the same bacilli were discovered with the aid of the microscope that were observed by the Commission whilst in Egypt (see before, p. 321). But this left it still undecided whether these bacilli did not belong to the regular parasites of the gut, having made their way into the mucous membrane of the intestine under the influence of the cholera disease. Some of the bacilli were, therefore, isolated from the intestinal contents of the purest cholera cases and cultivated in gelatine, so that their form and growth might be sufficiently studied to allow of their being distinguished from other bacilli. In this way it was demonstrated that this kind of bacillus was present in all the choleraic evacuations examined, as well as in all the intestinal contents from persons who had died of cholera. On the other hand, the bodies of eight persons who had died of pneumonia, dysentery, phthisis and kidney disease have been examined, as well as bodies of several animals and other substances abounding in bacteria, but in none of these cases has anything been found like the cholera bacillus. It is also reported that the same organism has been discovered in water from a tank, which had been suspected of having been a source of the disease.

In connection with this subject reference may be made to the recent important decision of Mr. Justice Pearson, in the case of *Ballard* v. *Tomlinson*, that the owner of a well may use it as a receptacle for sewage, even though in doing so he may contaminate other wells in the same water-bearing stratum. In this particular case the plaintiff was a brewer depending for a supply of water upon a well sunk into the chalk, which had been in use for the same purpose for thirty years. Within one hundred yards is another well, sunk into the same water-bearing stratum, which has of late been used by the defendant as a cess-pit. That both wells have a common source was not denied; indeed this was proved by putting chloride of lithium into the defendant's well and finding it forty-eight hours afterwards in water taken from the plaintiff's well. It was admitted also that in like manner the defendant's sewage made its way into the plaintiff's well, poisoning the water and rendering it entirely unfit for brewing or any other dietetic use. But it was claimed that this was within the defendant's right, both to abstract water from the well and to return it to the well polluted to any extent he pleased, and this claim has been upheld by the Court. The possible effect of this decision upon the public health will be evident, and Dr. Frankland has pointed out in a letter to the *Times* (Feb. 15), that there would appear to be nothing to prevent the establishment of an aniline colour factory in the neighbourhood of the deep wells in the chalk used by the Kent Water Company for the water-supply of a part of the metropolis, and the discharge of its waste arsenical liquors into the subterranean reservoir from which the water is drawn. The inconsistency exists, therefore, that whilst a manufacturer is not allowed to discharge any noxious material into surface water, he may do as he pleases with subterranean water.

REPORT ON ANALYSES OF SPECIMENS OF CINCHONA BARK.

Forwarded from Madras, through Her Majesty's Secretary of State for India, to the Pharmaceutical Society.

BY BENJAMIN H. PAUL, PH.D.

No.	Mark.	Description of Bark.	Quinine.	Quinidine.	Cinchonidine	Cinchonine.	Amorphous.	Total.
1	3/12	*C. officinalis*, renewed . .	4·86	0·09	0·07	0·40	0·48	5·90
2	5/22	,, coppice shoots	2·81	—	1·12	0·32	0·20	4·45
3	6/27	,, renewed . .	5·79	0·21	0·15	0·19	0·30	6·64
4	7/28	? corky, natural	4·08	0·45	trace	0·23	0·40	5·16
5	8/29	*C. officinalis*, renewed . .	5·75	0·20	0·12	0·16	0·44	6·67
6	10/9	,, ,, . .	3·72	0·36	1·00	0·96	0·40	6·44
7	12/13	,, ,, . .	6·09	0·21	0·62	0·66	0·53	8·11
8	A/0	,, (*Uritusinga*)	3·94	0·19	1·06	0·38	0·34	5·91
9	B/44	,, natural . .	4·71	—	0·12	0·20	0·40	5·43
10	C/25	,, ,, (*ang.*)	3·19	—	0·95	0·17	0·30	4·61
11	D/0	,, (*Uritusinga*)	2·45	0·04	0·43	0·22	0·30	3·44
12	G/0	,, renewed . .	4·19	0·20	0·26	0·44	0·30	5·39
13	13/0	*C. Pitayensis*, natural . .	3·93	0·25	0·07	2·40	1·00	7·65
14	15/1	*C. Pahudiana* ,, . .	1·24	—	0·60	trace	0·20	2·04
15	16/23	,, renewed. .	0·69	—	1·94	0·20	0·30	3·13
16	17/50	,, natural . .	0·37	—	0·67	trace	0·20	1·24
17	18/5	? corky, renewed	1·52	—	0·39	0·58	0·50	2·99
18	19/14	? ,, natural .	2·27	—	0·67	0·45	0·50	3·89
19	20/32	*C. micrantha* ,, . . .						3·23
20	21/48	*C. Calisaya* ,, . . .						3·31
21	22/49	,, natural . . .	3·86	0·23	0·30	0·43	0·40	5·22
22	23/47	,, ,, (*Joseph.*)						3·90
23	24/38	*C. anglica* ,, . . .	3·53	0·18	0·64	1·90	0·80	7·05
24	25/35	,, renewed . . .	3·30	0·27	0·86	0·80	0·70	5·93
25	H/46	,, mossed . . .	4·37	—	1·80	0·36	0·70	7·23
26	26/30	*C. pubescens*, natural (?) .	3·43	0·28	0·11	3·02	0·60	7·44
27	28/37	,, ,, . . .	3·91	—	2·88	0·60	0·40	7·79
28	29/29	,, renewed . .	3·51	—	1·62	0·48	0·40	6·01
29	31/11	? ,, . .	2·63	—	1·04	0·45	0·50	4·62
30	32/20	? mossed . .	3·01	trace.	1·21	0·22	0·40	4·84
31	33/34	? natural . .	6·16	trace.	1·57	0·34	0·48	8·55
32	35/31	*C. succirubra*, mossed . .	1·35	—	2·15	2·66	1·00	7·16
33	,,	,, renewed. .	2·86	—	1·72	2·50	0·70	7·78
34	36/33	,, natural . .	1·56	trace.	2·04	2·00	0·88	6·48
35	K/0	,, ,, . .	1·33	—	2·86	2 34	0·80	7·33
36	L/0	,, mossed . .	1·00	—	2·14	3·40	1·00	7·54
37	M/0	,, ,, . .	1·18	trace.	1·61	3·08	0·60	6·47
38	N/0	,, renewed. .	2·86	—	1·32	2·60	0·60	7·38
		NATURAL BARKS FROM DARJEELING.						
39	Indian.	*C. officinalis*	1·93	—	0·43	0·30	0·36	3·02
40	Indian.	,, root.	3·22	0·91	0·31	1·74	0·86	7·04
41	Indian.	*C. succirubra*	1·54	—	0·89	1·96	0·80	5·19
42	Indian.	? Ledger bark .	4·60	—	0·42	0·24	0·52	5·78
43	Indian.	? ,, ,, root	4·27	0·13	0·04	1·10	0·40	5·94

(1) This and two following samples are from *C. Condaminca*, How. variety.

(2) These botanical specimens and also the bark were taken from coppice shoots.

(3) The bark belonging to this specimen is renewed, after the tree had been subjected to the Java shaving process. In this the outer cellular portion is shaved or pared off, the inner vascular layer being left intact.

(4) Bark covered externally with a thick corky layer, very peculiar, of officinalis type but undetermined species.

(6) Large leafed or *C. Uritusinga*, Pavon type.

(7) This is the No. 2 variety, in the estate nomenclature, of the variety *C. angustifolia*, How.

(14) This species was discovered by Hasskarl, cultivated on a large scale in Java and found to be worthless. From Java it was introduced into India, where its culture never went beyond the stage of an experiment.

(17) This plant was said by Cross, on his recent visit to the Nilghiris, to be the *C. crispa* of which he sent seeds from the Loxa Mountains. That it came from Loxa there is no doubt, as the few specimens of it on the estate of Dodabetta are growing amongst the "crown" barks introduced from that region. It differs, however, very much from the *C. crispa* of Tafalla, which belongs to the *C. officinalis* group of Weddell. In general appearance it is more nearly allied to Weddell's section *Pahudianæ*. Its bark is also very peculiar, in fact unique.

(20) This form of the *C. Calisaya* grows to a considerable size and has bright green shining leaves, some of which measure from 6 to 7 inches in length by 3½ to 4 inches in width. Flowers pink, very sweetly scented.

(21) This plant approaches the *Boliviana* form of Weddell, but the *Calisayas* are most variable.

(23) This plant, according to Howard, is a hybrid between *C. Calisaya* and *C. succirubra*. On the other hand it is said to come perfectly true from seed. Mr. Surgeon-Major Bidie thinks it to be only a variety of *C. Calisaya*.

(26) This is not the *C. pubescens* of Vahl, but a plant which was considered to be a hybrid by the superintendent of the cinchona estates, the late Mr. McIvor. Mr. Cross regards it as the pubescent form of "Cuchicara," referred to by Dr. Spruce in the Parliamentary Blue Book of 1863, p. 116. Mr. McIvor stated that it is a hybrid between *Cinchona succirubra* and *Cinchona officinalis*.

(29) Pata de gallinazo of Cross.

When the valuable series of specimens of Madras cinchona bark was presented to the Museum of the Pharmaceutical Society by the Indian Government, through Dr. Bidie, it appeared to be important that analyses should be made, in order that the specimens might be rendered thereby more useful for reference, and that the analyses might be available for comparison with others which might be made subsequently on the plantations. Therefore having learnt from Mr. Holmes, the Curator of the Society's Museum, that portions could be spared from the Museum specimens without destroying their value for reference I undertook to carry out the examination. Unfortunately, the smallness of some of the samples precluded the possibility of dividing them. Only eleven specimens, however, out of the forty-nine received were too small to be divided. The preceding table gives the results obtained. The footnotes are taken from remarks written on the Herbarium specimens by Dr. Bidie. The specimens No. 39 to 43, marked "India," are barks which were forwarded last year from Darjeeling by Dr. King.

These specimens of bark illustrate very well the influence of hybridization in masking the characteristic features of the bark of particular species of *Cinchona*, and the difficulty of forming an opinion as to the source of samples as well as their value in regard to amount of alkaloid.

I learn from Mr. Holmes that a comparison of the samples of *C. officinalis* bark indicates that the only one which could be easily recognized is No. 4. In this sample the bark presents an extraordinary development of the suberous or corky layer, which is divided into angular pieces about half an inch square, each piece exhibiting a stratified appearance. It is totally different from Nos. 17 and 18, in which the suberous layer, although very much developed, presents a rough granular appearance more like toasted bread-crumbs and is very friable. The corky *C. officinalis* also possesses more quinidine (0·45) than the other varieties, and a good percentage (4·08) of quinine. No. 4 is evidently the bark referred to by Dr. Trimen in his report "On the Nilgiri Plantations," as being the "crispa" of McIvor and Beddome, of which a vigorous propagation was going on by seed. If it can be shown, therefore, by further analyses on the plantations that these percentages are tolerably constant, this variety would appear in every way to be specially suited for pharmacy.

On examination of the several specimens of renewed bark of *C. officinalis*, Mr. Holmes is of opinion that it would not be possible to recognize by physical characters bark rich in alkaloids from a poor one, and that however valuable such bark may be to the quinine manufacturer it would not be expedient for pharmaceutical use, unless a guarantee as to alkaloidal strength were supplied to the retail pharmacist. It is also of interest to note that in Nos. 2, 6 and 8 the smaller amount of quinine found by analysis is associated with an increased amount of cinchonidine. The fact that No. 2 was obtained from coppice shoots adds weight to the supposition that the age of the tree may have something to do with the yield of cinchonidine; while the fact that the renewed (No. 6) and the natural (No. 8) *Uritusinga* varieties yield less quinine than the *angustifolia* and *Condaminea* points to the latter as being the better varieties, *i.e.*, so far at least as can be gathered from a limited number of analyses.

The bark of *C. Pahudiana* might easily be mistaken by an unpractised eye for that of *C. officinalis*, and it seems desirable that such an inferior bark should be eliminated from the plantations as speedily as possible, lest by cross-fertilization it should deteriorate the seed of more valuable species. The same remark applies to the corky barks, Nos. 17 and 18, which, although very different in appearance from *C. Pahudiana*, are produced by a tree which has on its young shoots and capsules the peculiar coarse hairiness of that species, although in a less degree, forming a feature by which it is easily distinguished.

The specimens of the bark of *C. anglica*, from the Nilghiris, are not easily recognizable by physical characters, and Mr. Holmes considers that they bear evidence of the hybridization of the plants with *C. succirubra*, particularly No. 23, which gives 1·90 of cinchonine. This, he thinks, is further confirmed by the large leaves, resembling in size, shape and venation those of *C. succirubra*. The capsules also more nearly approach in size those of that species, being much larger than those of *C. Calisaya*.

With respect to the barks from Darjeeling, No. 39 to 43, Mr. Holmes is of opinion that the samples, judging from their physical appearance, were evidently collected from several different varieties of each species, and therefore the analyses cannot reveal anything special concerning them.

Judging from its physical characters the Ledger bark, No. 42, is good typical *Calisaya* bark, and does not at all resemble the thick bark with scattered warts which was recognized by Mr. Howard as Ledger bark, and of which samples presented by him exist in the Museum of the Society. Taken in conjunction with the analysis, the characters of the No. 42 bark indicate that it approaches most nearly to the *Boliviana* variety of *Calisaya*.

The Nilghiri *Calisaya*, No. 21, appears to be identical with that of Darjeeling. The herbarium specimen of the latter is marked 2000 feet, an elevation that is hardly high enough to develop the alkaloidal richness of the *Calisaya* to its utmost degree.

In Dr. Trimen's recent report on the cinchonas of the Nilghiris he lays great stress on the importance of analysis as a guide in the selection of plants for cultivation, and he expresses his conviction that in the present state of our knowledge, selection based on analysis is the most promising direction for the improvement of the trees as alkaloid yielders. From this point of view he recommends the isolation of trees with high analysis, together with other precautions to prevent cross fertilization, care in collecting seed, analysis of a selection of the resulting plants and destruction of all that do not reach the standard of their parent. It is by the continuation of this mode of procedure in the cinchona districts of the Madras Presidency that Dr. Trimen considers the interests of the great industry of cinchona growing in India can alone be efficiently promoted.

The attempt to draw deductions from the figures of the analyses now published of a limited number of specimens must, of course, be regarded as subject to correction by results of further examinations of a larger series of similar botanical specimens and barks that may come under future notice; but it may be hoped that the facts brought out by analyses of these specimens may prove of some value to the pharmaceutical public and to the energetic Directors of the plantations in India and elsewhere.

THE USES OF POTASSIUM PERMANGANATE IN ANALYSIS.*

BY ARTHUR G. HADDOCK, A.I.C.

My paper does not contain any novelties but is written with a view of showing what an exceedingly useful reagent the chemist possesses in potassium permanganate. I mean as a standard solution for use volumetrically.

I think every chemist who has technical analyses to make will admit that the system of volumetric determination is of the utmost use and convenience. It may be better to use gravimetric methods in cases were the substance can be precipitated in a definite form, in the pure state, and in a form absolutely insoluble in the menstruum used. But these three conditions, which are essential to the success of the operation, cannot always be obtained, and very often, even when it is possible, the number of operations which have to be gone through is so great, and the time required so long, that it would be a source of great inconvenience to the technical chemist to adopt this system. Both volumetric and gravimetric methods have their place in analysis, and it is sometimes convenient and desirable to adopt one system and sometimes the other.

For instance, if a determination of iron was required in a substance containing that metal or any of its compounds, together with manganese, no one would think of going to the trouble of separating the two, and precipitating and weighing the iron as oxide, but a volumetric agent such as bichromate or permanganate of potassium would be used, which would give the required result in a tithe of the time occupied by the other method, and, probably, with greater accuracy.

Permanganate of potassium is one of the most useful solutions which can be placed in a laboratory. The diversity of substances which can be tested with it, the simplicity of its application, and the accuracy of the results which are obtained, entitle it to a very prominent position in the analyst's cupboard.

The crystals may be obtained in commerce in an exceedingly pure form. We have some in the laboratory now, which were bought in the ordinary way, which are practically free from impurity. To try to make the salt on a small scale in the laboratory is both expensive and unsatisfactory, as it is very difficult to get it to crystallize nicely. However obtained, its purity should not be taken for granted, but after making the solution, its strength should be tested. For general purposes, perhaps, decinormal is the most convenient strength to make the solution. This would be obtained by dissolving 31·6 grains of the pure crystals in 10,000 grains of distilled water. It is better to dissolve a little more than the theoretical quantity, as it is very easy to dilute it to the proper strength after standardizing. The solution thus obtained may be standardized in several ways.

One is, by seeing how much FeO it will convert into Fe_2O_3. The purest soft iron wire is used for this purpose. About 2 grains is accurately weighed out and dissolved in dilute sulphuric acid in a flask fitted with a reducing cork to exclude the air, diluted with about 3000 grains cold water, and the permanganate solution run in without loss of time from a graduated burette. The operation is finished when the colour is no longer discharged, but a slight pink shade remains in the liquid. If the solution is decinormal it should require 357 grain measures for 2 grains of iron.

It is difficult to get pure iron wire. Soft binding wire or thin pianoforte, which are about the best, contain from $\frac{1}{4}$ to $\frac{1}{2}$ per cent. impurity, so that it is necessary to test the wire gravimetrically, once for all.

The double ferrous and ammonium sulphate is often recommended for standardizing with. It is stated to be exceedingly stable, and may be kept for months without oxidation. If pure materials are used in making it, and great care is taken in its preparation, this probably is so, but, otherwise, it is not to be depended on. When pure, 7 grains of this salt contain 1 grain of iron. It is dissolved in water, acidulated with dilute sulphuric acid, and the titration effected as with the solution of the iron wire.

I prefer to use oxalic acid to standardize with. It can be obtained very pure and is easily crystallized, so that by recrystallizing the commercial article it can be obtained in a state of absolute purity. 63 grains of the crystals ($H_2C_2O_4 2H_2O$) are equivalent to 31·6 grains permanganate. 3·15 grains may be weighed off and dissolved in about 3000 grains of water, and a little dilute sulphuric acid added. The action in this case only takes place in a hot solution; it must, therefore, be heated to about 70° C. and the permanganate run in as before. The colour is not discharged so quickly as with the iron salt. The solution first goes brown, then yellow, and, finally, colourless. The end-reaction is, however, very distinct, as it is impossible to mistake a brown or yellow shade for the final pink. 3·15 grains would require 500 grain-measures of $\frac{1}{10}$ normal permanganate.

The solution when standardized should be placed in a well-stoppered bottle and kept as much as possible in the dark. It sometimes deposits a little soon after it is made, and is apt to become slightly weaker on that account. After a few months all alteration ceases, and if dust and organic matter is kept out of it, the strength will remain constant for a very long time. I had a solution which, after the first six months, did not vary at all for over two years, and, indeed, very little alteration (2 per cent.) had taken place at the end of five years, and this was a solution I was constantly using. If a deposit forms it should always be restandardized.

With this solution many different determinations may be made. The following are some of the substances which may be estimated by it:—Iron, manganese, lead, calcium, oxalates, ferro- and ferri-cyanides, prussian blue, tannin, methyl alcohol, organic matter in water, etc.

Its equivalents are—

1000 =	3·16	$KMnO_4$
	5·6	Fe.
	6·3	$H_2C_2O_4.2H_2O$.
	2·8	CaO.
	42·2	$K_4FeCy_6.3H_2O$.
	32·9	K_3FeCy_6.
	4·156	Galls tannic acid.
	6·234	Oak bark tannin.
	28·67	Fe_7Cy_{18} (Prussian blue).
	0·80	Oxygen.
	4·53	$MnSO_4$.

Iron.—To estimate the amount of iron in a sample, it is treated in any convenient way to get it into solution in acid, then reduced by means of pure Zn (preferably amalgamated) to the ferrous state and titrated as before described in the standardizing.

$$10FeSO_4 + K_2Mn_2O_8 + 8H_2SO_4 = K_2SO_4 + 2MnSO_4 + 5Fe_23SO_4 + 8H_2O.$$

It is, of course, necessary that all organic matter shall be got rid of. In the case of samples containing only a small quantity of iron, it is desirable to concentrate it by precipitating it as hydrate or phosphate, and dissolving this in a litile acid. It is generally stated that unless a sulphuric acid solution is used the results are incorrect. No doubt, if a great deal of hydrochloric acid is present the results are vitiated to a certain extent, but it has been my experience that if the hydrochloric acid solution is reduced with zinc, and the action allowed to go on till the solution is neutral, and it is after this acidified with sulphuric acid, the results are very concordant and accurate. In iron ores and samples where the iron is in very considerable quantity, I prefer to use bichromate as the oxidizing agent, but in cases where the amount of iron is comparatively small, I think permanganate is preferable.

To estimate the iron in animal charcoal, which contains

* Read at a meeting of the Liverpool Chemists' Association, January 17, 1884.

from ·10 to ·60 per cent., I ignite 50 grains, dissolve in nitric acid, dilute to about 3000 grains, add ammonia in excess, then acetic acid in excess. The acetic acid dissolves the precipitated calcium phosphate, and leaves the phosphate of iron and alumina. These I filter off, wash slightly, ignite, dissolve in hydrochloric acid, reduce the iron with zinc until neutral, acidulate with sulphuric acid, dilute, and titrate with permanganate. The results obtained in this way agree very closely with each other. It is better for this purpose to have a weaker solution of permanganate, say $\frac{1}{20}$ normal.

Manganese.—The estimation of manganese gravimetrically is not at all an easy or satisfactory operation. The different precipitates have an extraordinary tendency to retain alkaline salts, and also on ignition it is extremely difficult to obtain the protosesquioxide in a fully oxidized state. It must also be separated from nearly every other base or they precipitate along with it.

But volumetrically, fortunately it is extremely easy to estimate it with the greatest accuracy. If solution of permanganate is added to a neutral or nearly neutral hot solution of a manganese salt, there is a precipitation of the manganese contained in both of them as dioxide.

$$2H_2O + K_2Mn_2O_8 + 3MnSO_4 = 5MnO_2 + K_2SO_4 + 2H_2SO_4.$$

The sample to be analysed is dissolved in aqua regia, diluted largely, neutralized as nearly as possible with Na_2CO_3, which is added until the precipitate which forms redissolves with difficulty, the solution heated nearly to boiling and permanganate solution added from the burette. A brown-black precipitate falls, which rapidly subsides, leaving a clear supernatant liquid, which remains colourless till the whole of the manganese is precipitated, when it retains a rosy-red colour. With care, it is easy to titrate it to a drop, and the results are very satisfactory. Any bases, other than manganese, which may be in the sample, are in a fully oxidized state, and do not at all interfere with the process. It is a point that the neutralized solution should be nearly boiling, as at lower temperature different reactions occur.

The manganese in an ore may also be determined by dissolving it with dilute sulphuric acid and a weighed quantity of pure oxalic acid in excess, when carbonic dioxide is liberated and 126 parts of crystallized oxalic acid are decomposed by every 87 parts of manganese dioxide present. The solution is diluted, boiled, and the excess of oxalic acid titrated with permanganate in the usual way. This process gives accurate results unless the sample is not completely decomposed by treatment in this way. Some samples of pyrolusite for instance are very difficult of solution. Unless any residue which remains undissolved is of a light colour it is not safe to trust to it. In any case the sample should be powdered exceedingly fine; five minutes with an agate pestle and mortar will often save an hour's subsequent bother.

Calcium is generally estimated gravimetrically by precipitation as oxalate, and conversion of the precipitate into carbonate by ignition. If the heat is very carefully regulated this gives good results, but it is difficult to know when just sufficient heat has been applied to decompose the oxalate, and not so much as to drive off the carbon dioxide from the resulting carbonate. However carefully the heating has been performed, the carbonate is always of a grey colour, and on dissolving it in acid organic matter is left behind. In limestone and similar substances I always use a volumetric process, as I have found it next to impossible to obtain satisfactory results in the other way.

The calcium may be precipitated in the usual way as oxalate, washed, transferred to a flask, acidulated with dilute sulphuric acid, and the oxalic acid titrated with permanganate, which indirectly gives the calcium.

$$5CaC_2O_4 + K_2Mn_2O_8 + 8H_2SO_4 = K_2SO_4 + 2MnSO_4 + 5CaSO_4 + 10CO_2 + 8H_2O.$$

Or a weighed quantity of pure oxalic acid in excess may be added, the solution made up to a bulk and an aliquot portion of the clear filtered liquid titrated with permanganate, which will give the excess of oxalic acid which has been added.

Lime, when in large quantity, as in limestones, I prefer to estimate as follows:—Ignite the precipitated oxalate strongly or at any temperature higher than sufficient to decompose it. Dissolve the resulting carbonate and oxide in standard hydrochloric acid, and neutralize the excess of acid with standard solution of caustic soda. Making experiments with pure Iceland spar I have several times got within ·05 per cent. of the theoretical quantity.

Ferrocyanides.—If permanganate is added to an acid solution of a ferrocyanide it converts it into ferricyanide.

$$10K_4FeCy_6 3H_2O + K_2Mn_2O_8 + 8H_2SO_4 = 10K_3FeCy_6 + 6K_2SO_4 + 2MnSO_4 + 38H_2O.$$

About 3 grains of the sample are taken, diluted largely with water, acidulated with sulphuric acid, and standard permanganate solution added until the yellow colour disappears and a faint pink tinge takes its place. The end reaction is not very clearly defined, but a little practice accustoms one to the reaction and a number of analyses of the same sample may be made differing very slightly from each other. Some chemists prefer to add a few drops of dilute ferric chloride solution; this gives a greenish coloration as long as any ferrocyanide is left, and which disappears when the operation is finished. Whether this is advantageous or not seems to depend a great deal on which colour the experimenter is sensitive to.

Ferricyanides may be estimated by first converting them into ferrocyanides. This is effected by boiling with caustic potash, and adding ferrous sulphate solution from time to time until the precipitate which falls is black, and then filtering from the precipitated oxide of iron. The solution is then made very dilute, acidified with sulphuric acid, and the ferrocyanide titrated as before.

Prussian blue may be estimated by boiling with caustic potash, filtering, acidifying, and titrating the ferrocyanide produced with permanganate solution.

$$Fe_7Cy_{18} + 12KHO = 3K_4FeCy_6 + 2Fe_2 6HO.$$

Tannin.—A number of methods have been devised for the estimation of tannin in barks, wood extracts, etc., all claiming superiority, but I am afraid none of them come up to an ideal standard of perfection. The results obtained for the same sample when tested by different methods exhibit a charming variety, and indeed it is a pleasure to get anything like the same result twice together by the same method. The methods generally adopted are all volumetric and I think the best of them is the one devised by Lowenthal, and improved by Neubauer, which consists essentially in oxidizing the tannin by means of permanganate. Whether this process gives the true amount of tannin or not, I cannot say; but, at all events, the same results (or thereabouts) can be obtained from the same sample time after time, so that a comparison can be made of the relative values of different specimens of the same kind of material. This process is described in Sutton's 'Volumetric Analysis,' and in Allen's 'Commercial Organic Analysis.' The fullest description, with the latest improvements, will be found in the latter work. There are one or two curious bits of arithmetic in the calculations, but they will be self-evident to any one who works the process. It is there recommended to separate the tannin with Cologne glue, which I suppose is a kind containing very little oxidizable matter; but it seems difficult to obtain, and I therefore have used isinglass, which answers quite well.

Methyl alcohol.—Permanganate solution has been proposed by Cazeneuve and Cotton (*J. Pharm.*, ii., 361, 367), as a means of estimating the amount of methyl alcohol in ethyl alcohol. There is an abstract of the paper in the *Journal of the Chemical Society*, 1881, p. 198. By using this process, I have succeeded in detecting 10 per cent. methylated spirit (90 ethyl, 10 methyl) in ethyl

alcohol, or that is to say 1 per cent. of pure methyl alcohol when mixed with ethyl. In using this process the alcohol should be previously distilled to eliminate colour and organic matter.

Organic Matter in Water.—Permanganate of potassium was years ago in great repute as an indicator of the amount of organic impurity in potable waters, but for a time got into bad odour with chemists, and the results obtained by it regarded with distrust. However, by devising several improvements in the manner of applying it, Dr. Tidy has succeeded in re-establishing its reputation, and it is now once more regarded as a valuable agent in determining the organic pollution of potable water.

I have noticed that whenever we get a bad water to analyse it invariably consumes a large quantity of permanganate solution, and I have come to look on this test as *primâ facie* evidence of organic contamination. A water which rapidly decolorizes permanganate, which when evaporated to dryness gives a coloured residue, and whose residue when exhausted with alcohol and the alcoholic solution on evaporation to dryness leaves a coloured and deliquescent residue, is one which I look on with great suspicion.

A simple way of applying the permanganate test to a potable water is to measure 8 ounces of the water into a *clean* flask, acidulate it with 10 to 20 drops sulphuric acid, and add a solution of permanganate (4 grs. in 10,000) from a burette, until the coloration which is produced by 3 drops does not fade in thirty minutes or so. When the colour remains permanent after that lapse of time, the operation may be considered finished. If, working in this way, the water consumes less than 40 grains of the permanganate solution it may be regarded as sufficiently free from sewage contamination to produce any injurious effects, but if it takes more, further examination is required before it is safe to pass it as a good water. If the permanganate is rapidly decolorized, it points to sewage infiltration; if slowly, to peaty and vegetable matter. If the water is turbid from suspended matter it should be filtered previous to making the test, and the floating matter examined microscopically. This process which is so easy of performance, is of course, not so scientifically perfect as Dr. Tidy's, but as a preliminary test it seems to afford valuable information as to the organic purity, or otherwise, of a potable water.

The uses which I have mentioned are sufficient to show that in permanganate of potassium the chemist has a valuable agent, and one which no doubt can often be beneficially employed.

NOTE ON HYDRARGYRUM FORMAMIDATUM.*

BY JAMES C. WILSON, M.D.

Some accounts of this preparation have appeared in recent journals. Towards the close of last year, Professor Liebreich proposed, in a meeting of the Berlin Medical Society, a new drug for the treatment of syphilis by the hypodermic method. Chemically, this drug belongs to the amide group. Liebreich was led to use it, from the fact that the ordinary amides of the body, of which urea is the principal one, are eliminated in an undecomposed state. When, however, the amide is in combination with a metal, decomposition occurs, and the metal is reduced and deposited. Liebreich found, by actual experiment, that this statement is true of mercury. It is supposed that the formamidated mercury, after hypodermic injection, undergoes decomposition, and that the metal mercury is set free in the tissues. The preparation is soluble in water, of neutral reaction, does not coagulate albumen, is not precipitated by caustic soda, and the presence of mercury can be demonstrated by potassium sulphide. It produces its effects very surely and rapidly. Liebreich regards it as the best remedy known for the hypodermic treatment of syphillis by mercury, as it is but little liable to excite local troubles or salivation. Later (*Med. Times and Gazette*, July 7, 1883), we find that Professor Zeissel, in Vienna, after trial of this remedy in fifteen cases of syphilis, was well satisfied with the results. In three of these cases salivation was produced. Some pain followed its injection, which was not, however, so severe as that following the hypodermic use of mercuric chloride. Twenty injections was the maximum number required to disperse the manifestations, even in severe cases.

Dr. Schacht, of Berlin (*New Remedies*, September, 1883), writes as follows:—

"Formamide is a colourless liquid, boiling at about 195° C., which can be distilled without decomposition only *in vacuo*. It is prepared by acting upon formate of ethyl by ammonia. When pure it is neutral, but easily becomes acid.

"If a *concentrated* solution of formamide be *boiled* with precipitated mercuric oxide, decomposition ensues, and metallic mercury is separated.

"On the other hand, if a dilute solution of formamide be *warmed* on the water-bath with precipitated mercuric oxide, a clear, colourless solution results, in which soda (hydrate of sodium) produces *no* precipitate. Sulphide of ammonium, however, precipitates the mercury as sulphide, both from the formamide of mercury and from mercuric chloride. Solution of albumen is precipitated by the latter salt, but not by the formamide.

"Formamide of mercury is prepared in the following manner:—10 to 13 grams of freshly precipitated, completely washed and still moist mercuric oxide are generally warmed with a little water in a porcelain capsule, with gradual addition of 10 grams of formamide. As soon as solution has taken place, the resulting colourless liquid is filtered into a litre-flask, and the latter filled to the litre-mark with distilled water. Each cubic centimetre contains 0·01 gram of mercury, which is the quantity representing one hypodermic dose. Formamide of mercury keeps well in brown-coloured bottles, and should also be dispensed in these."

In a note from Vienna (*Med. News*, October, 13, 1883), it is stated that Professor Neumann is now trying hydrargyrum formamidatum on a large scale as an antisyphilitic. It is used hypodermically in doses of 1 c.c. It acts with far greater efficacy upon the recent efflorescences than upon the later manifestations. Pain of great severity and active local inflammatory troubles have resulted in Neumann's cases.

The preparation I exhibit, made by Merck, of Darmstadt, is a 1 per cent. aqueous solution, and the dose of it is from half to one ordinary hypodermic syringeful.

It has not been possible to obtain this drug in Philadelphia until the present time.

* Read before the Philadelphia County Medical Society, October 17, 1883. Reprinted from the *Pharmaceutical Record*, January 15, 1884.

THE USE OF LITMUS, METHYL ORANGE, PHENACETOLIN AND PHENOLPHTHALEIN AS INDICATORS.*

BY ROBERT T. THOMSON.

The number of indicators which have been proposed to supersede litmus is now very great, but none, as far as I am aware, have been thoroughly tested as regards their efficiency in presence of the impurities which constantly occur in the alkaline hydrates and carbonates of commerce. There is no lack of information to be obtained concerning the high tinctorial power of these indicators compared with that of litmus, and their delicacy when

* Read before the Chemical Section of the Philosophical Society of Glasgow, January 22, 1883, and reprinted from the 'Proceedings.'

employed in the determination of alkalies in solutions of the pure hydrates and carbonates ; but on the question of their value in presence of sulphites, thiosulphates, sulphides, phosphates, silicates, aluminates, etc., little or no attention has been bestowed.

In the following paper are detailed the results of a series of experiments I carried out with the view of testing, in as complete a manner as possible, the merits of litmus, methyl orange, phenacetolin, and phenolphthaleïn as indicators in the estimation of alkalies and certain free acids. Instead of taking these indicators in succession, and recording all the tests made with them, I have considered it preferable to take the substances which were tested by the standard acid or alkali, and state the result obtained with each indicator. By this means a close comparison of the behaviour of the different indicators with the same substance will be secured.

The tests were made in such a way that the solution employed would measure about 100 c.c. when the end-reaction was observed. The strengths of the indicator solutions (·5 c.c. of which was used for every experiment) were so arranged that equal volumes of each gave, as nearly as could be judged from their different tints, the same intensity of colour at the point at which the change caused by the addition of excess of acid or alkali was just complete.

I.—Delicacy of the Indicators in Absence of Interfering Agents.

This was tested by adding the ·5 c.c. of the indicator solution to 100 c.c. of distilled water, and finding how much decinormal acid or alkali (1 c.c. = ·0031 gram Na_2O or ·004 gram SO_3) was required to change the colour.

Litmus.—This indicator, as is well known, is naturally blue, and remains so in presence of alkalies and alkaline carbonates, but changes to red when a slight excess of acid is added. The litmus solution employed contained 20 grams of the dry extract per litre. Half a c.c. of this was mixed with 100 c.c. of distilled water, and decinormal sulphuric acid added from a burette, drop by drop, till no further alteration in colour was observed. To accomplish this ·5 c.c. of the acid was consumed. This is equal to ·05 c.c. (about 1 drop) of normal acid, which is the strength usually employed in alkalimetric tests.

Methyl orange.—It is soluble in water with formation of an orange yellow liquid, which is unchanged in colour by alkalies or alkaline carbonates and bicarbonates, but is transformed to a deep pink by a mineral acid. The solution employed contained ·15 gram of the methyl orange per litre, and ·5 c.c. of decinormal acid was required to effect a complete change in the colour, when tested in exactly the same way as the litmus solution. It is thus on an equality with litmus as regards delicacy in absence of all salts.

Phenacetolin.—This substance is soluble in alcohol with formation of a dark brown liquid, which gives with the hydrates of potassium and sodium, even in presence of carbonate, a scarcely perceptible yellow, with ammonia and the normal alkaline carbonates a dark pink, with the bicarbonates a much more intense pink than with the normal carbonates, and with mineral acids a golden yellow colour. The solution employed contained 2 grams of phenacetolin per litre, and was tested by decinormal carbonate of sodium, of which ·1 c.c. was required to produce a decided change from a faint brown tinge to a dark pink.

Phenolphthaleïn.—This indicator gives rise to a fine red colour in presence of alkaline hydrates and carbonates, but with bicarbonates (in absence of normal carbonates) and free acids no colour is produced. Phenolphthaleïn is almost insoluble in water, but is readily soluble in 50 per cent. alcohol. The solution used contained ·50 gram per litre, and was of a pale yellow colour, which was probably due to a slight impurity. When tested under the conditions observed in the case of the other indicators, ·1 c.c. of decinormal hydrate of sodium caused a sudden transformation, the colourless solution becoming red.

In the following Table (I.) will be found a summary of the results given above.

Table I.

Showing the delicacy of the indicators in the absence of interfering agents.
Amount of distilled water used for each test . . 100 c.c.
Amount of indicator solution used for each test . 0·5 c.c.

Name of Indicator.	Grams of Solid Matter per litre of Indicator solution.	Amount of decinormal acid or alkali required to change colour of indicator.
Litmus	20·0	·5 c.c. H_2SO_4
Methyl orange .	·15	·5 c.c. „
Phenacetolin . .	2·0	·1 c.c. Na_2CO_3
Phenolphthaleïn .	·5	·1 c.c. NaHO

II.—Application of the Indicators to the Determination of Soda existing as Hydrate with a small Proportion of Carbonate.

The solution of caustic soda employed was of normal strength, and each test was made with 50 c.c., which thus contained 1·55 gram of available soda. The soda existing as carbonate in this quantity was ·024 gram and was estimated by precipitation with chloride of barium.

Litmus.—When this indicator was used exactly 50 c.c. of normal sulphuric acid were consumed. The solution was, of course, boiled thoroughly after each addition of acid, especially when near the neutral point, and only a single drop was required to effect the end-reaction.

Methyl orange.—The great advantage claimed for methyl orange over litmus is that with the former no boiling is required, as carbonic acid has no effect on the colour. On making several determinations of soda with this indicator, I found that its delicacy was by some means considerably impaired, as the pale yellow colour became just perceptibly tinged with pink when 49·95 c.c. of the normal acid were added. The change in colour was very decided when 50, but was not fully developed till 50·15 c.c. were consumed. In these cases ·2 c.c. of the acid was necessary to bring out the full intensity of colour, while ·05 c.c. produced the same result in absence of interfering agents. It would be naturally expected that if half the quantity of methyl orange were used, a proportionately more delicate end-reaction would be secured, but at least ·15 c.c. of the normal acid was required to occasion the alteration in tint. Again, the same expectation might reasonably be entertained with regard to varying the proportions of soda, but I found that when ·775 gram of soda was tested ·15 c.c., while with 3·1 grams of soda, ·25 c.c. of the test acid was indispensable in effecting the complete transformation. It is evident that this extension of the end-reaction over from ·15 to ·25 c.c. of normal acid must be due, either to the liberated carbonic acid, or to the salt of sodium produced by the action of the acid on the hydrate and carbonate of sodium. That it is solely owing to the latter cause I shall show when the action of the neutral sulphates, chlorides and nitrates of the alkalies is under consideration. On looking over these results the question arises, At what point is the estimation of alkali, when methyl orange is used as indicator, to be reckoned as finished? The point I have adopted is that at which the first *decided* change in colour is apparent, and this end-reaction coincides exactly with that of litmus. The intensification of the colour by the further addition of acid serves as a confirmation of the first reading. Greville Williams, in a paper which appeared in the *Chemical News*, xxxix., 98, recommends

for each determination the use of from ·1 to ·2 c.c. of a solution containing ·1 gram of methyl orange per litre. The larger of these quantities is about one-fourth of that which I have employed, and when excess of acid is added gives a very faint pink colour, which is sensibly less intense in presence of much sulphate of sodium. It is obvious, however, that the amount of the indicator solution used must be varied according to the volume and colour (if any) of the solution in which the alkali is to be determined.

Phenacetolin. — This indicator was introduced by Degener for use in the determination of the respective proportions of hydrate and carbonate of sodium in the same solution, and was tested by Professor Lunge, whose results will be found in the *Jour. Soc. Chem. Industry*, i., 55.

To determine the hydrate of sodium the normal acid was added till the scarcely perceptible yellow colour gave place to a rose-pink, which remained permanent for a few minutes at least. Two tests gave respectively 49·1 and 49·2 c.c. of acid consumed, which are equal to 1·523 and 1·526 gram of soda existing as hydrate, as against 1·526 obtained by deducting the soda existing as carbonate (which was determined by chloride of barium) from the total soda. It must be carefully borne in mind that the rose colour should be permanent, for it may be developed by adding a drop of the acid, even when there is still a little hydrate present, and then fade slowly away The first reading can be confirmed by adding a drop or two more acid, which should render the colour more intense.

To find the proportion of soda existing as carbonate the addition of acid was now continued. The colour at first was intensified, then became mixed with yellow, and finally all the pink tinge was eliminated, and a golden yellow was produced. For each test 50 c.c. of the normal acid were consumed, thus giving in the one case ·9 c.c. for the soda as carbonate, and in the other ·8 c.c., showing respectively ·027 and ·024 gram of soda existing as carbonate, as against ·024 estimated by chloride of barium. A much sharper end-reaction is obtained by boiling off the carbonic acid after each addition of acid when determining the portion of soda existing as carbonate.

Phenacetolin is not adapted to the estimation of small quantities of hydrate in presence of a large proportion of carbonate of sodium or potassium, as is evident from the following test. To a solution containing 2·65 gram of carbonate of sodium and 0·4 gram of hydrate of sodium in 100 c.c., phenacetolin was added, but even after an hour had elapsed the dark pink colour did not disappear, as it should do if the process were of any value.

Phenolpthaleïn.—This indicator, which seems first to have been employed by Luck in that capacity, can also be used for the determination of the proportion of hydrate and carbonate of sodium in the same sample. The method of procedure is to add the normal acid to the cold alkaline solution till the red colour is discharged, taking care, by using a dilute solution and keeping the point of the burette in the liquid, that no carbonic acid escapes. The point at which the colour is dispelled is when all the hydrate is neutralized, and the carbonate has been converted into bicarbonate according to the following equation:—

$$2Na_2CO_3 + H_2SO_4 = 2NaHCO_3 + Na_2SO_4.$$

By this means the whole of the soda existing as hydrate and half the soda as carbonate is determined. The number of c.c. consumed is now noted, and the estimation continued, boiling thoroughly after each addition of acid to decompose the bicarbonate of sodium, and thus bring back the red colour. It is preferable, as pointed out by Warder in his paper in the *Chem. News*, xliii., 228, to add excess of normal acid, boil off the carbonic acid, and titrate back with normal caustic soda. The results of several experiments gave 49·6 c.c. of normal acid consumed for the hydrate and half the carbonate of sodium, and 50 c.c. for the total available soda, or, in other words ·8 c.c. for the carbonate and 49·2 for the hydrate. These results agree almost exactly with those obtained by the estimation of the carbonate of sodium by barium chloride, and with the use of phenacetolin as indicator. It must be noted that the more carbonate of sodium there is present the less delicate will the end-reaction be, as the red colour gradually fades away during the first portion of the titration. It is also evident, from the nature of the process, that this method is quite unreliable for the determination of a small quantity of hydrate of sodium in presence of a large proportion of carbonate of sodium.

Table II.

Showing results obtained by each indicator when used in the determination of soda in caustic soda containing a little carbonate of sodium.

Soda, existing as hydrate, employed . 1·526 gram.
Soda, existing as carbonate, employed. ·024 gram.
Total soda employed . . . . . 1·550 gram.

Name of Indicator.	Grams of total Na_2O found.		Grams of Na_2O as hydrate found.		Grams of Na_2O as carbonate found	
Litmus	1·55	1·55	...		...	
Methyl orange .	1·55	1·55	...		...	
Phenacetolin . .	1·55	1·55	1·523	1·526	·027	·024
Phenolphthaleïn .	1·55	1·55	1·526	1·526	·024	·024

III.—Estimation of Available Potash in Caustic Potash.

It is quite unnecessary for me to give any details of the results of the experiments made under this head. Litmus and methyl orange can be used for the determination of the total available potash, and phenacetolin and phenolphthaleïn for the estimation of the respective proportions of hydrate and carbonate of potassium with as great accuracy as in the case of the caustic soda.

IV.—Estimation of Ammonia existing as Hydrate.

The liquor ammonia used for the following tests did not contain an appreciable quantity of carbonate, and was free from other impurities. It was diluted with an indefinite quantity of water, and 50 c.c. of the dilute sample were employed for each determination. This quantity, according to a result obtained by converting the ammonia into chloride of ammonium and drying at 100° C., contained ·547 grams of ammonia (NH_3).

When litmus, methyl orange, or phenacetolin was used, exactly 32·4 c.c. of normal sulphuric acid were consumed, which are equal to ·550 gram of ammonia. The end-reactions in each case were quite as delicate as with caustic soda. As phenacetolin produces with ammonia the dark pink colour characteristic of its reaction with the carbonates of sodium and potassium, and not the faint yellow formed with the hydrates of these metals, the respective proportions of hydrate and carbonate of ammonium cannot be determined by titration in presence of this indicator.

In the two determinations made with phenolphthaleïn as indicator 31·5 c.c. and 31·4 c.c. of the normal acid were consumed. After 25 c.c. had been added the colour began to fade away slowly, and was fully discharged at the point mentioned. These results show respectively ·535 and ·533 gram of ammonia, and are so far below the truth as to be equal to about 3 per cent of the whole ammonia present. It is, therefore, perfectly plain that phenolphthaleïn is utterly useless for indicating the end-reaction in the estimation of ammonia. The anomalous behaviour of phenolphthaleïn is due to the action of the salt of ammonium which is formed, and which destroys the red colour produced by the ammonia when the proportion of the latter becomes small. That this is the true explanation will be shown when the effect of the neutral salts of ammonium on the indicators comes to be examined.

(*To be continued.*)

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 23, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BENEVOLENT FUND.

IN the present number of the *Pharmaceutical Journal* unusual prominence is given to the subject of an institution which indisputably has a claim upon the attention of every registered chemist and druggist in the United Kingdom. It is to the honour of our country that there exist in it many organizations for the relief of the indigent and sick, some of which are general in the scope of their operations, whilst others are confined within more or less restricted limits. But there is no arrogance in the assertion that not one of them is more worthy of support from the class to whom it specially appeals than the Benevolent Fund which was founded more than forty years ago by the earliest leaders of the Pharmaceutical Society, and which is still administered by the Council of that body. Instituted originally with the object of providing for the relief of any who were in distress among the Members and Associates of the Society or their widows and orphans, the true nucleus of the Fund was constituted by a donation in the year 1842 of £500 from the general assets of the young Society, and this was increased by similar sums set aside from the Society's funds in 1843 and in 1844. These sums, together with all the donations, were invested, and to this funded capital were added at intervals any unexpended balances of subscriptions and interest left from the gradually increasing annual income, until in the Annual Report for 1865, when the investments amounted to nearly £6500, the Council felt warranted in recommending the Society to incur the responsibility of granting annuities. In that year accordingly two persons were chosen to receive the sum of £30 each annually from the Fund, and since then no year has passed without the election of fresh annuitants. Up to that time previous connection with the Pharmaceutical Society had been a qualification essential to a successful application for assistance; but a desire to extend the sphere of the application of the Fund induced the Council, which was just then seeking the legislation that came eventually in the shape of the Pharmacy Act, 1868, to avail itself of the opportunity to obtain powers that would authorize the extension of the benefits of the Fund to the needy of the whole body of qualified chemists and druggists as constituted by that Act. In order to appreciate properly the liberality of this course, it must be remembered that the Pharmaceutical Society was not then nearly so representative of the trade as it is now, and the immediate effect was to extend the potential scope of the Fund from about 2500 persons to more than 12,500. Nevertheless, two years afterwards, in 1870, another donation of £500 was voted from the funds of the Society to be invested in what had now become a General Benevolent Fund for chemists and druggists. In addition to this it may be stated that from its initiation the Fund has been administered by the Council of the Pharmaceutical Society and has never been subjected to any of those expenses for management which constitute so serious—and yet unavoidable—a charge upon the income of nearly all benevolent institutions.

It is not surprising therefore that, fostered thus carefully, the Fund has prospered. The investments now amount to £19,400, whilst the income from annual subscriptions and donations last year reached the respectable sum of £1922. On the other hand, the annuitants have now increased to forty—a number which bears no unworthy proportionate relation to the total number of registered chemists and druggists, and which represents an annual sum of £1350, whilst the money expended last year in casual relief amounted to £675. The Fund has therefore now attained proportions, both in respect to its receipts and its expenditure, upon which all chemists and druggists may well be congratulated, especially since it can now be officially declared that "no genuine case of necessity presented to the Council is left unaided by temporary assistance." In order, however, to maintain this degree of efficiency, not only has the Council to exercise the greatest vigilance through its Committee in the careful examination of all applications for help, but it has also continually and persistently to urge the claims of the Fund to the generous consideration of all chemists and druggists who are in a position to contribute towards the alleviation of the distress of their less prosperous brethren.

There is one direction, however, in which the repeated appeals of the Council have not been responded to in the degree that might have been expected. We refer to the large number of chemists and druggists that still abstain from connecting themselves with the Pharmaceutical Society as Members or Associates, and who, apparently as a corollary, do not subscribe to the Benevolent Fund that it dispenses. For it is a fact, that whilst nearly 50 per cent. of the Members and Associates of the Society subscribe to the Fund, only about 11 per cent. of the registered chemists and druggists outside the Society contribute to it. Or, to put the case in another form, the nine thousand chemists and druggists unconnected with the Society between them only subscribed last year £385 12*s.* 8*d.*, while the class of Pharmaceutical Chemist Members of the

Society alone subscribed £516 19*s.* 6*d.* Nevertheless there is no ground for supposing that chemists and druggists outside the Society are less willing to relieve the distress of the afflicted to the best of their ability than those who are connected with it. It is thought probable rather that, notwithstanding the numerous occasions on which the Fund has been brought under their notice, they still remain imperfectly acquainted with the catholic character of the Fund and the advantageous conditions under which it is administered. It is in the hope of promoting the removal of any such remaining misapprehension or prejudice on the subject that the occasion of sending a copy of this Journal, containing a classified list of Subscribers and Donors to the Fund, to every chemist and druggist on the Register, is utilized once more to explain the character and urge the claims of this valuable institution. In the first place it may be stated that the relief afforded from the Fund is given in two forms. Urgent cases are helped temporarily by grants of money based upon the recommendation of a Committee charged with the investigation of the *bona fides* of each application. Other cases, which are thought worthy of more permanent help, are also placed on the list of approved candidates, from which a certain number, dependent upon financial considerations, are elected every year by the subscribers and donors themselves to receive annuities for the remainder of their lives. During the year 1883 the money expended in temporary aid amounted to £660 10*s.*, of which sum £260 went to registered persons, £330 to widows, and £70 10*s.* to orphans. The annuities paid during the same year to forty-two men and women above sixty years of age amounted to £1283 15*s.* With respect to the recipients, it cannot be too distinctly stated that no other qualification for relief from the Fund is ever required than that the application is made on behalf of a person whose name is on the Register of Chemists and Druggists, or the widow or children of such a person, and that it can bear the test of an inquiry. Indeed, it may be mentioned here that the grants and annuities received last year by persons who had never been connected in any way with the Pharmaceutical Society exceeded by far the amount subscribed by persons outside it. The Fund is maintained by annual subscriptions and donations, which may be paid to any Local Secretary of the Society, or forwarded direct to the Secretary, Mr. Elias Bremridge, 17, Bloomsbury Square, W.C. Every person subscribing half-a-crown annually is entitled to one vote at each election of annuitants, whilst each half-a-guinea represents five votes. By giving five guineas in one sum a person may become a life subscriber with five votes at each election, and each additional guinea will entitle him to another vote. Similar donations from firms or corporations entitle them to the same number of votes during ten years. In conclusion we express the hope that this simple statement may prepare the way in many instances for a favourable reception of the local secretary or whoever else may be seeking contributions to the Fund.

SCHOOL OF PHARMACY.

As will be seen by the advertisement in the present number, the courses of lectures on "Chemistry and Pharmacy" and "Materia Medica and Botany," in connection with the Pharmaceutical Society's School of Pharmacy, 17, Bloomsbury Square, will recommence on Saturday, March 1, at 9 a.m., when Professor Bentley will give his first lecture on Botany. Professor Redwood will commence his course on "Chemistry and Pharmacy" on Monday morning, March 3, at 9 o'clock.

Students will find the ensuing five months a favourable period for studying at the School, for between March 1 and the end of July they will have an opportunity of attending not only Practical Chemistry in the laboratories and the usual courses of lectures on Chemistry and Pharmacy and Materia Medica and Botany, but also the summer course on Practical Botany and the Classification of Plants, at the Royal Botanic Society's Gardens, in the Regent's Park, where every opportunity will be afforded to them of obtaining a practical acquaintance with medicinal plants and the natural orders.

In addition to the above courses of lectures and Practical Chemistry, there is also Mr. Ince's class for "Practical Instruction in Dispensing," which will recommence on Tuesday, March 4, and be continued until the end of July.

THE CHEMISTS' ASSISTANTS' ASSOCIATION.

It is pleasant to be able to congratulate the Chemists' Assistants' Association once more on the success of its Annual Dinner, which was held on Wednesday evening last, at the Holborn Restaurant, under the presidency of Mr. R. S. Atkins, the Vice-President of the Pharmaceutical Society, one hundred and fifty members and their friends being present. The Chairman, in proposing the "Medical Profession," referred to the great amount of unpaid labour and the other important services which the members of it are continually rendering to the public. On the one hand, he said, the eminent London specialist is consulted by the friends of the peer, and on his decision, as the ultimate court of appeal, life or death may be said to hinge; and on the other, the hard-worked, ill-paid provincial practitioner is summoned long distances, regardless of wind and weather, to attend the wife or child of the peasant. He took the opportunity, also, to remark that pharmacists wished to be true to the traditions of the Pharmaceutical Society and to keep to their own line of action, whilst they hoped that the medical profession would keep to theirs. Dr. H. Macnaughton Jones, in replying, reviewed the progress of knowledge of disease during the past forty or fifty years and said that much of this had depended on

the valuable assistance of pharmacists. Speaking as an examiner he regretted that medical students were not compelled to learn more pharmacy than was now required of them. In his opinion the prescribing of proprietary preparations by medical practitioners went dangerously near to empiricism. The toast of the "Pharmaceutical Society" was proposed by Mr. MILLHOUSE, who said that the claims of the Society for further State recognition were based upon the technical education which had been provided and fostered by it. Mr. GREENISH replied, and referred to the absence of community between members of the trade before the institution of the Society, and he drew a contrast between the educational facilities of to-day and those which existed forty years ago. The Chairman then proposed the toast of the evening, "The Chemists' Assistants' Association," and referred to the great advantages which the Association afforded from a social point of view, and also to its claims to recognition on account of the good scientific and practical work which it was doing. Mr. PARKINSON, in replying, spoke of the formation and subsequent work of the Association, and said he hoped it would soon become self-supporting and would not have to depend upon the subscriptions of gentlemen who were not members of it. He thought there ought to be a sufficient number of members to make the Association a success financially. The toast of "The Visitors" was proposed by Mr. WINFREY and replied to by Professor ATTFIELD, and, lastly, that of "The Chairman" was proposed by Mr. BRAITHWAITE and suitably acknowledged by Mr. ATKINS.

In the evidence given by Dr. Campbell Brown at the recent trial of two women at the Liverpool Assizes for the murder by poisoning of the husband of one of them, he stated that the liquor contained in a flask produced was a neutral solution of arsenic, resembling the liquor which he had obtained by extracting eight out of nine samples of fly paper with water. Although Dr. Brown does not seem to have committed himself absolutely to the theory that fly papers had been the source of the arsenic used in the poisoning, it is understood that one of the prisoners, since her conviction, has admitted that this was the case. We venture, therefore, to remind our readers that about five years since (*Pharm. Journ.*, [3], viii., 1039), Mr. Plowman called attention in our correspondence columns to the prevalence of arsenical fly papers, and the evil results that might be consequent on their unrestricted sale.

* * *

The proceedings under the Massachusetts Adulteration Act for the sale of faulty drugs, to which reference was made a few weeks since, appears to have created much uneasiness among the druggists of the State. As one consequence a letter has been addressed by the President of the Boston Druggists' Association, Professor Markoe, to the Board of Health, asking that any druggist who may be found to have supplied an article in violation of the law may receive official notification of the fact and that prosecutions may not be instituted except when a person continues to sell the challenged article after receiving such a notice. The Board has, however, declined to take the course suggested, on the ground that it would be neither reasonable nor just and would make the "Board directly responsible for the condition of the whole drug market." The *Sanitary Engineer* goes further and describes the request as "a piece of effrontery that we have seldom seen equalled

* * *

We understand that Herr Knapp, the Curator of the Herbarium of the Vienna General Pharmaceutical Association, is to accompany a scientific expedition that will start next month for Northern Persia to explore the fauna and flora. It is to be hoped that the journey may incidentally contribute to our knowledge of materia medica.

* * *

Notwithstanding the existence in New Zealand of a "Sale of Poisons Act" which, although it allows scheduled poisons to be sold by others than qualified pharmacists, contains provisions as to the registry of sales, labelling, etc., similar to those in the British Pharmacy Act, the Colonial Government has recently by an Order in Council added other restrictions upon the sale of arsenic and strychnia. Henceforth it will be illegal for any person in New Zealand to sell either of these poisons unless before making the requisite entry of the sale he obtains from the intending purchaser a statutory declaration setting forth his or her name, occupation and address, the exact quantity of the poison required, the express purpose for which it is intended to be used, and the place or places where it is to be used or deposited. Immediately after the completion of the sale the seller is to forward the statutory declaration to the registrar of the district. A meeting of pharmacists was to be held in Dunedin to consider the effect of this Order.

* * *

Professor Bentley, Professor Attfield and Mr. E. M. Holmes have been elected Honorary Members of the Philadelphia College of Pharmacy, "as a mark of respect for their scientific researches and acquirements." Professor Attfield was elected a Corresponding Member in 1869.

* * *

On Friday, the 15th inst., the Institute of Chemistry Bill was presented in the House of Lords, read a first time, and referred to the Examiners.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, the 27th inst., when a paper on "Coal Tar Derivatives used in Pharmacy" will be read by Mr. Joseph F. Burnett.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, February 28, at 8 p.m., when a paper on "Some Silicon Compounds" will be read by Mr. F. MacDiarmid, and a Report on Botany will be made by Mr. E. Baily.

* * *

The next meeting of the Manchester Pharmaceutical Association will be held at The Owens' College (Coupland Street entrance), on Tuesday evening next February 26, at 7.30 p.m. when the following papers will be read:—"Disinfectants," by Mr. W. Kirkby, and "A Note on Exotic Henbane," by Mr. W. Elborne.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The annual general meeting was held in the Society's Room, on Wednesday evening, February 6. Mr. J. Preston, the retiring President, in the chair.

The minutes of the last general meeting were confirmed.

The Secretary announced that the following donations had been received during the year:—The *Pharmaceutical Journal*; Calendar of the Pharmaceutical Society; Register of Chemists and Druggists, from the Pharmaceutical Society of Great Britain; the 'Year-Book of Pharmacy,' from the British Pharmaceutical Conference.

It was unanimously resolved, on the motion of the President, that the best thanks of the Society be given to the respective donors.

On the motion of Mr. Smith, seconded by Mr. Marshall, Messrs. Brookes, Chatterton, Cobban, Grierson, Holleley, Humphrey, Jacques, Johnson and Kite were elected Associates of the Society.

The Annual Report was then read by the Secretary, as follows:—

"Annual Report, 1883.

"Your Council in again presenting its report for the year would call attention to the following items of business:—There have been five general meetings and six Council meetings, all of which show a full attendance and testify to the vitality of the association.

"The financial condition of the Society is a matter of congratulation, inasmuch as the balance in hand has not been greatly touched upon, especially when we consider the extraordinary calls which have been made upon it. The receipts for the current year amount to £10 5*s.* 1*d.*, which is mainly made up of the small subscriptions. This with balance in hand, £16 16*s.* 2*d.*, brings the total to £27 1*s.* 3*d.* The expenditure for the year is made up as follows:—Rent, £5; gas, 10*s.*; coals, 2*s.* 3*d.*; insurance, 3*s.*; printing, stationery and other secretarial expenses, £8 2*s.* 3*d.*, make a total on the other side of £13 17*s.* 3*d.*, which, with bank interest 7*s.*, leaves a clear balance in hand of £13 11*s.* 0*d.*

"It will be noticed that the balance now in hand is a decrease on that of last year, but this is owing to the extraordinary demand which has been made upon the funds, and which is not likely to occur again. The Council would suggest that the original sum of 10*s.* for membership should be again adopted.

"A pleasing feature of the year's work is that gentlemen not directly connected with the trade have freely given their edifying services, whose efforts were fairly appreciated by the full attendances at the respective meetings. Your thanks are specially due to Messrs. Hibbert and Wood. The services of members of the association have greatly contributed to maintain the life and activity which has marked its career during the year.

"A special meeting of the members of the Society and the trade was called during the year to consider the proposed Pharmacy Acts Amendment Bill, the discussion on which was fully reported in the pages of the *Pharmaceutical Journal*, and at no little expense to the Society, but your Council has the satisfaction of knowing that the views then enunciated were respectfully considered, and appreciated in high quarters and elsewhere.

"During the year a communication with respect to the Pharmacopœia revision was discussed at one of the Council meetings, and the action then taken we have reason to believe was much appreciated by the Pharmaceutical Society of Great Britain.

"At the meeting of the British Pharmaceutical Conference at Southport, in September last, your Society was represented by Messrs. Furness, Learoyd, Newsholme and Ward as delegates.

"Your Council has perseveringly kept the subject of education before it, and a scheme was propounded and inaugurated, the lecturers of Firth College considerately adapting their course of lectures and laboratory practice to the requirements of the curriculum of the Pharmaceutical Society. These efforts have met with some success, and your Council believes that the small beginnings augur hopefully for Sheffield as a pharmaceutical centre. The efforts in this direction will not be relaxed until circumstances prove that they are no longer needed.

"Your Council has been greatly encouraged by the increased attendance at the monthly meetings, especially of the younger members of the trade, and it recognizes with gratitude the growing desire amongst many to fit themselves for the high position which they will probably, at no distant time, have to occupy.

"Your Council also desires to record the fact that a junior association has lately sprung up, holding its meetings in the Society's rooms twice a week, having for itself a President in the person of Mr. N. S. Smith, 4, High Street, and a Secretary, Mr. J. Marshall, 74, Market Place, the objects of the Association being purely intellectual, viz., for the study of the subjects required for the Minor examination and on the principle of mutual improvement; judging from its beginnings it will doubtless prove helpful to all concerned.

"In conclusion, your Council feels that it cannot close this report without again referring to the good work the Society is doing, not only in promoting good feeling amongst the chemists generally, but in providing opportunity for mutual benefit and improvement."

The adoption of the report was moved by Mr. Preston, and seconded by Mr. Maxey, and carried unanimously.

The election of President now took place.

Mr. W. Ward, in proposing that Mr. Preston be again elected to the Presidential chair, referred to the good work done by him during his two years of office, and said that the Society had never been in so prosperous a condition as at the present time, and that Mr. Preston had contributed largely to this by his energy and attention to the interests of the Society.

Mr. Furness seconded the resolution, which, being put to the meeting by Mr. Ward, was carried unanimously.

Mr. Preston, on rising, said that whilst he accepted the office of President for the third time he did so reluctantly. He considered that they had greatly honoured him in proposing him again, and he should not have been induced to accept the responsible position had it not been for the pressing representations made to him. However, in accepting, he did so partly because he had been encouraged by the success which had marked the efforts of the Council in the past; a success which was evidenced by the increased attendance at the monthly meetings and the lively discussions which had ensued, also by the increased numbers which had recently joined their ranks, especially from amongst the younger members of the trade. He believed that it was better that new blood should be alike introduced into the Presidential office as well as into the body corporate of the association, and this conviction was dead against the position he now took up. He would have refused to undertake the duties they now desired him to take, if by doing so he would not have laid himself open to a charge of sheer stupidity, and inasmuch as he did not lay claim to belong to the particular animal which bore this character he bowed to the wish of his *confrères*. In looking forward to the future, his hopes were that, the Society would prove still more useful to its members, by that mutual interchange of opinions, on trade topics, so necessary, in the present condition of trade, with its varying usages and in the hard competition going on all around. He believed that it could be made still more useful in a higher sense also, by the reading of papers and discussions thereon of subjects having a pharmaceutical interest; and, it might be, by

advancing the chemical knowledge, which the public—an increasingly discerning public—demanded from them. And lastly, not least, certainly, by proving an aid to their younger friends who were now showing a vitality in self-education which was hopeful for the future status of the pharmaceutical chemist. He believed that knowledge in this direction was not only power, but a lever which would, if rightly used, advance their positions in innumerable ways. The absence of this in the chemist of the future would be folly, and must consign the owner of it to a position of ridicule among his fellow men. He recently heard of a case where such a young man, in the last part of his apprenticeship, was asked by a customer what the difference was between "proto sulphate of iron and sulphate," and to his shame he replied, Well, he knew there was a difference, but he was not able to say what it was. To these ends he trusted the Council and members of the Society would press, and with self-denying help from the masters and a wise use of the opportunities which such an association as this, with the help which our local schools afforded, the younger members themselves, he hoped, would be able to acknowledge the benefits which accrued from their membership, remembering that the battle was not always to the strong or to the swift, but to the persevering and the plodding.

The following were the other officers elected for the year:—Vice-Presidents, Mr. J. M. Furness and Mr. Joseph Watts; Hon. Secretary, Mr. G. T. W. Newsholme; Treasurer, Mr. W. Jervis; Auditor, Mr. G. A. Cubley; Council, Messrs. Dobson, Ellinor, Fox, Learoyd, Maxey, Smith and Ward.

LIVERPOOL CHEMISTS' ASSOCIATION.

The eighth general meeting of the thirty-fifth session was held at the Royal Institution, January 31. Mr. Edward Davies, President, in the chair.

The minutes of the previous meeting were read and confirmed and the following donations to the Library and Museum were announced:—'The Annual Report of the Liverpool Amateur Photographic Association, 1883,' from the Association; 'The Year-Book of Pharmacy, and Transactions of the British Pharmaceutical Conference, 1883,' from the Conference; 'The Calendar of the Pharmaceutical Society of Great Britain' and the *Pharmaceutical Journal*, from the Society; and *The Science Monthly Illustrated*, from the Editor.

Mr. L. S. Ward was elected a member.

Mr. A. C. Abraham exhibited a specimen of kola nuts and also a portion of his apparatus for milk analysis.

Mr. A. H. Mason drew attention to a letter from Mr. Blunt, in the *Pharmaceutical Journal*, January 26, in reference to Mr. A. C. Abraham's statement, in the previous week's Journal, that he (Mr. Abraham) believed that the difference in strength in lime water, when made from unwashed lime, was due to the presence of sulphates and chlorides of potash and soda in the chalk, which would be converted into the hydrates during the process of burning. Mr. Mason remarked, that same years ago, *viz.*, in 1874, he had drawn attention to a similar fact, which was recorded in the transactions of that date.

Mr. A. C. Abraham said that as this matter had been referred to, he might point out that while Mr. Blunt had confirmed his statement with regard to the presence of hydrates of potash and soda, he had also strangely stated that the amount which he found was not sufficient to account for the excessive strength noted in the lime water, whereas as a matter of fact, the quantity found by Mr. Blunt would account for this difference many times over.

Mr. Davies thought that Mr. Blunt had probably overlooked the fact that all the hydrates of potash and soda would be taken into solution in the first washing, whereas but a small portion of the lime was dissolved.

The President then called on Mr. J. C. Bredin to read his paper on "Alchemy." The paper gave a very interesting *résumé* of the alchemists of the Middle Ages, and showed how their groping after the secrets of the production of the different forms of matter led to the foundation of the modern science of chemistry. The paper was interspersed with anecdotes, and evinced throughout much care in its compilation.

Mr. Conroy proposed, and Mr. A. C. Abraham seconded, a vote of thanks to Mr. Bredin for the pleasure the meeting had derived from his maiden effort before the Association. The vote was carried unanimously.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Wednesday evening, February 6, the half-yearly meeting of the above Association was held at the rooms, No. 4, Halford Street, when the members sat down to a substantial tea. After which votes of thanks were passed to the retiring Committee, and to Mr. Edwards.

The Honorary Secretary then read the report of the session, in which the fact of one of the present members having passed the Major examination of the Pharmaceutical Society was prominently noticed. It also contained expressions of thanks to the honorary members for their continued support and to the Society and Conference for their supply of Journals and gift of the 'Year-Book of Pharmacy.'

The financial statement shows a balance of about 21*s.* due to the Treasurer; a state of affairs which is considered more satisfactory than in the corresponding half-year of 1883.

A new Committee was elected, from whom Mr. J. J. Edwards was chosen President, Mr. E. Brice Vice-President, Mr. J. Garrett Honorary Secretary, and Mr. W. B. Clark Treasurer.

On the following Wednesday, February 13, the President, Mr. J. J. Edwards, inaugurated the new session with an able description of the microscope together with its uses. Towards the close he exhibited several specimens of starches and physiological substances, to the great delight of his audience.

A vote of thanks to the lecturer, proposed by the Chairman, Mr. E. Brice, concluded the meeting.

EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The eighth meeting of the sixth session of this Association was held in the Pharmacentical Society's rooms, 118A, George Street, Edinburgh, on Thursday evening, February 14, at 9.15; Mr. Claude F. Henry, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the Chairman called upon Mr. William Pirie to read a paper on "Mineral Waters.'

After sketching briefly the origin of springs with the probable manner in which the more common ingredients of mineral water were taken into solution, Mr. Pirie gave some quaint information regarding the composition of mineral waters as related by writers of last century. He then proceeded to discuss the more important waters under four groupings, namely, sulphurous, chalybeate, acidulous and saline. The composition of several of the more common waters was then treated of and the essay was concluded with some thoughtful remarks on the different therapeutical properties of natural as contrasted with artificial saline solutions.

The Chairman, in proposing a vote of thanks to Mr. Pirie, said that he was confident that all had received instruction from the thorough, yet lucid and happy manner in which the essayist had brought the subject before them.

Mr. Turnbull seconded the motion, which was heartily awarded.

There followed a discussion which was taken part in

by Messrs. Coull, Crowden, Hill, MacEwan, Stephenson and others.

Queries were then submitted and replied to by many members. The Chairman intimated that at the next meeting Mr. Peter Boa will read a paper entitled "The Cultivation of Taste in the Practice of Pharmacy."

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

The Chemical Work of Wöhler.

On Friday the 15th inst., Professor Thorpe delivered a lecture at the Royal Institution upon "The Chemical Work of Wöhler." Remarking upon the training that Wöhler had received, Professor Thorpe said he entered the University of Marburg in 1820, and though it was the wish of his family that he should study medicine, he never attended any regular course of lectures upon chemistry. The following year, however, he published his first paper on selenium, and soon afterwards placed himself under Gmelin at Heidelberg, with whom he remained until the earlier part of 1825, employing the greater part of his time in the study of prussic acid and other cyanogen compounds. Wöhler then went to Stockholm to study under Berzelius, with whom he stayed a few months, learning his modes of manipulation in mineral analysis, and of whose laboratory he gives a graphic description. Whilst in Stockholm he worked especially upon monoxychloride of tungsten, and succeeded in convincing Berzelius that chlorine was a better name than oxidized muriatic acid. He formed a great friendship with Berzelius, and afterwards translated his 'Jahresbericht.' Returning to Germany the same year, he was appointed to the Technical School at Berlin. In 1827 Wöhler succeeded in isolating aluminium, and in the following year he accomplished the synthesis of urea, which revolutionized previous ideas as to organic compounds. In 1829, he investigated the nature of mellitic acid, and his results were published simultaneously with those of Liebig, who had unknowingly worked upon the same subject and arrived at the same conclusions as Wöhler. Soon afterwards Wöhler returned to the study of cyanic acid, whilst about the same time Liebig and Gay-Lussac experimented upon fulminic acid. The results of these investigations showed that these two acids, though widely differing in their properties, had the same composition; this difference was afterwards explained by Wöhler in his treatise on Isomerism. Becoming acquainted with Liebig, he suggested that they should make a joint investigation upon the benzoyl compounds, which work was very completely carried out in 1832. After a lapse of five years Wöhler made another series of experiments, conjointly with Liebig, upon amygdylin and bitter almond oil; and in the following year, 1838, he made his last important investigation with Liebig, upon the nature of uric acid. Wöhler then gradually turned his attention more towards the analysis of mineral bodies, though occasionally he worked with Liebig, as in the investigation of opianic acid, and on the derivatives of cyanic acid and urea, as well as thialdin and selenaldin. In 1850 he experimented upon the cyano-nitrides of titanium, and in 1852 and the three following years he devoted his time to the study of the tellurium compounds with organic radicals. In 1857, he made, with Ste.-Claire Deville, a joint investigation of boron and the nitrides of silicon and titanium, and in the same year discovered hydride of silicon. In 1860, Wöhler accomplished the last of his principal investigations, that of theobromine, the organic base in cocoa. Though little known in England, Wöhler, who was the first chemist that succeeded in effecting the synthesis of organic bodies, had many distinctions conferred upon him by various societies, amongst which was that of the Copley Medal in 1872. Ten years after receiving this medal he died, at Gottenburg, at the age of eighty-two years.

Parliamentary and Law Proceedings.

Supposed Poisoning by a Narcotic.

Mr. Wightman held an inquest on Tuesday last at Park, Sheffield, on the body of Frederick Castle, aged six weeks.

Sarah Ann Castle identified the body as that of her son. He had been a healthy child, with the exception of crying a great deal. A week ago, as the druggist's shop was closed, she went to a grocer named Mr. Wilcock, in South Street, and asked him if he had anything that would "do for the baby," as it was always crying. He said he had some "stuff," and another person had used a great deal of it. Witness then went and procured a bottle and bought a pennyworth. She did not know what it contained, or what it was called, for there was no label on the bottle, but Mr. Wilcock told her to give the child ten drops. She gave the child the "stuff" at 10.30 on Friday night. About 11.30 p.m. she gave deceased some bread, water and sugar, and then went to bed at twelve o'clock, the child appearing to be as usual. When she awoke at 6.30 the next morning, the child was lying with his hands clasped together and his eyes open, and making a noise. She got up at nine o'clock and left the child in bed, and that was the last time she saw it alive. On going upstairs at 11.35 death had taken place.

The coroner's officer produced a bottle containing a few drops of liquid of a brownish colour. Witness said the bottle was that she had fetched the "stuff" in. There was no label upon the bottle.

The Coroner, after smelling at the contents, said that he thought it contained laudanum and paregoric. He should order a *post-mortem* examination to be made. The inquest was then adjourned.

At the adjourned inquest on Wednesday, Mr. Arthur Hallam, surgeon, said he had made a *post-mortem* examination. The deceased appeared to be about six weeks old, and seemed to be fairly well nourished. He found congestion of the lungs and brain. The appearances were consistent with opium poisoning. That was the cause of death, in his opinion. Death had been slow. If the child had had convulsions it would have died rapidly Mr. Hallam went on to say that the child looked as though it had not had any food for ten or twelve hours before its death. He had seen the bottle which contained the mixture purchased by the deceased's mother, and there was a strong smell of laudanum in it. He could not tell what the mixture was, but he perceived a distinct odour of laudanum. The mixture had not been prepared by a qualified medical man.

The Coroner: What would be the effect of ten drops on a child six weeks old?

Mr. Hallam: Well, I know that a fifth of a grain of opium would kill a child three months old, and that is only equal to two drops of laudanum.

The Coroner here read the evidence of the deceased's mother given the previous day and said: Are these symptoms at all consistent with poisoning by opium?

Mr. Hallam: Certainly.

Mr. Thomas Wilcock said he was a grocer at No. 81, South Street, Park. He had known Mrs. Castle and her husband for three years. He remembered her coming to his shop a week ago last Saturday. She brought a child between two and three years of age with her. She said she wanted some infant's mixture for the child which she had with her, and she purchased a quarter of an ounce of the mixture.

The Coroner: Did you tell her how much to give the child?—Yes; I read it from the label on my bottle.

You did not put a label on her bottle?—No.

How much did you tell her to give the child?—I told her about ten drops would be a proper dose.

Witness, continuing, said he got the mixture from Messrs. Davy Brothers, wholesale grocers, and they got it made up by Mr. Lindley, chemist, Sheffield Moor. He did not know that it contained laudanum, and did not ask what it contained. He sold it by what the label on the bottle said.

The Coroner: Does the label on your bottle say poison?

Witness: No, sir. He advised Mrs. Castle to have some of the mixture because he thought it would do the child good.

The Coroner: How could you recommend that mixture when you did not know what it contained?

Witness: I sold it to another woman, and she used a lot of it.

The Coroner: Would you have objected to give the woman any if she told you it was for the baby?

Witness: I do not think I should have objected, but I should have recommended a smaller dose.

The Coroner: I may as well tell you that if you sell that stuff it is your duty to know what it is; and if it contains poison you are bound to put on a label, which label must contain the name of the article, the word "poison," and the name and address of the seller. It does not matter whether you sell it yourself, or whether your apprentice or assistant sells it. If you do not put a label on it, and it is found that there ought to have been one, you are liable to a penalty of £5 for the first conviction and £10 for the second. Ignorance is no excuse. Whatever may be the result of this inquiry, I think you may go from this room with the conviction that you will be prosecuted, and it ought to be a warning to all in a similar position.

Mr. Wilcock's bottle, from which the mixture was taken, was here produced. It bore the following label:—

"Carminative Mixture for Infants.

Children one to three months old				5 to 10 drops.
,,	4 ,,	6	,,	,, ...10 ,, 20 ,,
,,	8 ,,	12	,,	,, ...half a teaspoonful.
,,	13 months to 3 years		,,	.....one teaspoonful.

H. Lindley, Dispensing Chemist,
57, South Street, Sheffield Moor."

The Coroner: If this bottle contains opium Mr. Lindley is in the same comfortable position as you are. He is liable as well. (To Mrs. Castle): Will you swear that the bottle which you took had no laudanum in it?—Yes, I will. It had only a little brandy in it.

The Coroner: It is just possible that the mixture does not contain laudanum. According to the smell there does not appear to be much doubt that there is some proportion of laudanum in it.

Mr. Hallam recalled, in answer to the Coroner, said that he was of opinion that the few drops of the mixture left in the small bottle were of a similar nature to that in the large bottle.

The Coroner: Can you undertake to swear that the child died from any narcotic at all?

Mr. Hallam: No, I cannot swear; but I can find nothing else to account for death.

The Coroner said he did not feel justified in closing the inquiry without knowing whether there were narcotics in the mixture or not. The contents of the bottle might be harmless, but it was just as much the duty of the jury to find out that as whether they were hurtful.

The inquest was accordingly adjourned until the 3rd of March, to allow of the contents of the bottle being analysed.

Reviews.

Lectures on Practical Pharmacy. By Barnard S. Proctor. Second edition.*

The name of this well-known writer is quite sufficient recommendation for anything he may have to say on practical pharmacy. He has himself worked out the subjects on which he treats, and the reader has before him in these pages the printed results deduced from long experience.

The present volume constitutes a second and enlarged edition, with much careful revision of the original lectures. The text has undergone general correction, and sundry details have been omitted to make way for necessary additions without a too great increase of space.

The value of the book has been enhanced for reference purposes by a copious index, the absence of which was a defect in the manual as first published. We have still the lecture form retained, and the instruction conveyed is more a record of personal observation than an exposition of teaching derived from accredited sources.

Mr. Proctor is especially good when attempting to describe a pharmacopœial process, an illustration of which may be found in the pages devoted to Percolation. "Filtration," says the author, "is the passing of a liquid through a solid, with the view of the solid separating something from the liquid; percolation is the same operation, with the view of the solid imparting something to the liquid." After this definition he proceeds to sketch the manner in which percolation may be applied; the precautions indispensable to success when operating on various substances; approved forms of apparatus and the importance of intelligent packing.

Probably the degree of attention to this last point accounts for the discrepancy of opinion entertained by experimenters as to the value of the process.

Turning to quite a different subject, the unguentum hydrargyri nitratis, one is relieved to find that that interminable question is not made an excuse for an essay, and we thoroughly agree with the writer when he states:—"There has been much stated about the difficulty of making a good nitrate of mercury ointment, and a great number of formulæ have been suggested. There need not, however, be any deviation either from the ingredients or the mode of operating directed in the British Pharmacopœia." When once official authority had sanctioned the proportions of mercury and nitric acid which had long been used in private laboratories, no further change was requisite.

Following Mr. Proctor behind the dispensing counter, those who themselves are practically versed in compounding medicines will recognize in the lecturer a safe guide for others who are anxious to learn the art and mystery of dispensing.

We miss indeed certains excellent excipients for pill masses of difficult combination, and each pharmacist of any standing would be able to suggest minor improvements; but a general exposition of the subject is given, sufficient to direct the student in all material points; and we have no intention of blaming the writer of a book for being unable to supply that peculiar knowledge which personal and actual manipulation can alone supply.

The same remark applies to the series of autograph prescriptions, which gave so distinct a character to these lectures on their first appearance.

The selection (thirty-two in number) is soon exhausted, and may be taken rather as a sign-post to indicate the path to the traveller than as a guide-book to direct his steps. The facsimiles are now relegated to the end of the volume at the conclusion of the text in order that the student may not be tempted to read the commentary

* London: J, and A. Churchill. Demy 8vo. Pp. i.–xvi., 1–493. With 32 plates. 12s.

before having made a fair effort to decipher the handwriting of the formulæ.

In example No. 28 a doubt rests on the reading of an ingredient which looks much like infus. diosmæ. It was so read by Mr. Proctor:—"I felt no hesitation in reading the infusion as diosma, though the patient said it was not the same as he had previously. Infus. quassiæ seems next in order of probability." Since the appearance of this facsimile several pharmacists in Buxton assured the author that they were familiar with the handwriting and the custom of the writer, and that the infusion was undoubtedly quassia. We felt, in 1873, no more hesitation than Mr. Proctor; and we would venture to express regret that a member of the profession should have the custom to write one thing and to mean another.

With this brief notice we must leave the lectures on practical pharmacy, stating only that the pharmacy of special drugs has been considerably enlarged, and that there is a new chapter entitled "Supplementary Notes on Pharmaceutical Testing.

We cordially commend the volume, and consider it indispensable to the rising pharmacist. It is now ten years since Mr. Proctor came before the public as the author of a treatise which was then most favourably received, and the present issue bears marks throughout of the maturer judgment and larger experience of the author.

CHEMISTRY: GENERAL, MEDICAL, AND PHARMACEUTICAL, INCLUDING THE CHEMISTRY OF THE U.S. PHARMACOPŒIA. By JOHN ATTFIELD, F.R.S., etc.* Tenth Edition. Specially Revised by the Author for America.

This Manual of the general principles of chemical science and their applications in medicine and pharmacy is too well known in this country to need any description or criticism. The work is almost as popular in the United States, where indeed it probably is more widely used by pharmaceutical students than any other text-book on chemistry. The present is, we believe, the fourth edition that has been prepared with special reference to the United States Pharmacopœia, and has been thoroughly revised so as to cover the widely extended area and the altered conditions of the last edition of that work. Although the typographical arrangemeet is not, in our opinion, so hel; ful to the eye as that in the English edition, in respect to the paper, printing and binding, the American book is far superior, and reflects especial credit upon the publishers.

* Philadelphia: Henry Lea's Son and Co. 1883. 12mo. Pp. i.-xvi., 1-727.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PHARMACEUTICAL SOCIETY.

Sir,—I have read, with feelings of amazement almost, the letter in last week's Journal on the above subject, signed "W. Wilkinson," and I should like to say a few words in reply. I cannot believe that Mr. Wilkinson will be very much gratified at seeing his strong effusion in print, notwithstanding that he expresses a wish that it should be printed. Surely he might be a little more charitable in his mode of expressing his "disgust," for, as you say, such strong language as he uses only tends to minimize the efficiency of the Pharmaceutical Society as a representative body. I am quite of the opinion that the registered chemist, in however small a way of business, should be on an equality with men in a larger way, and that no co-operative store should be allowed to deal in poisons.

But I think if instead of writing so strongly Mr. Wilkinson would show a little more loyalty to the Pharmaceutical Society, to which I presume he belongs, and, if he chooses, only vote for those members of the Council who pledge themselves to use their influence to restrain co-operative stores from dealing in poisons at all, he would be much more likely to gain the sympathy of his brother chemists. I trust some one more able than myself will reply to Mr. Wilkinson, but I hope he will forgive me if I advise him to be more considerate in his denunciations and just in his criticisms, and also lend a helping hand at any time he can do so to the Society; he will thus be far more likely to further the objects of the Pharmaceutical Society and the interests of pharmacy, which I trust he has at heart.

Stoke Ferry. W. H. NEWSAM.

Sir,—Mr. W. Wilkinson is scarcely fair to the Pharmaceutical Society. Surely it is not their fault if the House of Lords pronounced an insane decision *re* "limited companies," a decision that may be law, but assuredly is not common sense, and, if legal, the state of the law cries loudly for alteration.

Certainly the remarks about juries, however, seem remarkably tame! Why go cap in hand, when the law for once is distinctly on the pharmaceutical chemists' side.

Again, *re* sale of poisons. Why should not every chemist adhere strictly to the letter of the law, and then sell in accordance with it, and resent the expression of every insulting coroner, who demands, as is not unusual, more caution than the law compels? This might help in passing more wholesome and stringent protective laws.

It is useless for Mr. W. Wilkinson to clamour for protection for chemists direct. It can only be obtained indirectly by pleading and proving the necessity for the safety of the public.

Does Mr. W. Wilkinson, moreover, wish the "poor beggar" to compete with him without qualification?

A CHEMIST.

Sir,—I do not quite perceive which you consider the "weakest link of the chain" in my letter, nor what you mean by its serving "to illustrate one of the influences which tend to minimize the efficiency of the Pharmaceutical Society as a representative body," unless you agree with what I have written.

I can only say that it was the expression of a feeling that prevails very widely both amongst the members and the trade outside, and could you read the expressions of sympathy and approval I have received since its publication you might perhaps come round to the opinion that the efficiency of the Pharmaceutical Society would be very much increased by a more vigorous policy.

Cheetham Hill, Manchester. W. WILKINSON.

"*Detective.*"—In order to make your caution of any service our statements would have to be more precise than we could venture to make them with our present knowledge of the facts. In this and all similar cases application of the adage "*caveat emptor*" is the only real safeguard.

T. and T.—The gelatine capping is made by adding to seven pounds of light coloured glue ten ounces of glycerine and three pints of water. When the glycerine and water have been absorbed by the glue the whole is placed in a water-bath and the pigment added. See papers in *Pharm. Journ.*, [2], vii., 448 and 511.

W. D.—We cannot advise you; consult your solicitors.

W. T. Frost.—Apply to the Secretary for a copy of the pamphlet 'Hints to Apprentices and Students.'

Fritz.—(1) Any person may extract teeth, but only a registered person can legally represent himself to be a dentist. (2) The labels approach the limits very closely, if they do not transgress. It would be better to submit them to the Inland Revenue authorities.

Mr. Ward is thanked for his communication.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Fletcher, Cruickshank, Corry, Pring, A. K. F., W. R. F., F. J. F., Dispenser.

LOCAL LIST OF SUBSCRIPTIONS

TO THE

BENEVOLENT FUND

RECEIVED DURING 1883.

	£	s.	d.
Aberaman.			
Sims, William	0	5	0
Aberayron.			
Jones, John Price	0	2	6
Aberdare.			
Jones, D. W.	0	5	0
Smith, Morgan	0	2	6
Aberdeen.			
Broomhead, George E.	0	10	6
Coutts, Charles	0	5	0
Cruickshank, Geo. P.	0	5	0
Davidson, Charles	1	1	0
Giles, William	0	5	0
Glover, W. K.	0	2	6
Gordon, William	0	5	0
Johnston, John	0	5	0
Kay, James P.	0	5	0
Kemp, James	0	10	6
Paterson and Sons	0	10	6
Presslie, R. D.	0	5	0
Reid, David	0	5	0
Shepherd, James	0	10	0
Sinclair, William	0	10	0
Strachan, Alexander	0	5	0
Aberfeldy.			
Macnaughton, H. B.	1	1	0
Abergavenny.			
Shackleton, G. W.	0	2	6
Abergele.			
Hannah, John	0	5	0
Lloyd, Edward	0	5	0
Aberystwith.			
Davies, David J.	0	5	0
Ellis, Robert	0	2	6
Thomas, John	0	5	0
Wynne, Edward P.	0	10	6
Abingdon.			
Preston, Alfred P.	0	5	0
Smith, William	0	5	0
Smith, William F.	0	5	0
Aboyne.			
Petrie, James J.	0	5	0
Abridge.			
Windus, Arthur E.	0	5	0
Accra (West Coast of Africa).			
Jones, Thomas	2	5	4
Accrington.			
Stanley, Thomas	0	2	6
Addiscombe.			
Townsend, Charles	0	10	6
Alcester.			
Adcock, Isaac Dickson	0	10	6
Overbury, Henry	0	5	0
Ratherham, William	0	5	0
Aldershot.			
Williams, James	0	10	6
Alexandria, N.B.			
McFarlane, Peter	0	5	0
Alfreton.			
Robinson, Joseph S.	0	10	6
Alnwick.			
Newbigin, James L.	0	10	6
Newbigin, Lesslie	0	5	0
Alresford.			
Connor, Thomas H.	0	5	0
Richardson, J. H.	0	2	6
Ambleside.			
Bell, Thomas	0	10	6
Herd, Henry W.	0	2	6
Ampthill.			
Allen, George	1	1	0
Brown, James	0	10	6
Andover.			
Gould, Robert G.	0	10	6
Angmering.			
Freeland, Alonzo J.	0	2	6
Freeland, H. W.	0	2	6
Annan.			
Rae, Robert S.	0	10	6
Appleby.			
McCounal, A.	0	5	0
Arbroath.			
Burn, David H.	0	5	0
Ashbourne.			
Bradley, Edwin Sylvester	0	10	6
Greaves, Frederick W.	0	5	0
Osborne, James	0	5	0
Reckless, A. H.	0	10	6
Ashby-de-la-Zouch.			
Bullen, George W.	1	1	0
Ashford (Kent).			
Ingall, Joseph	1	1	0
Stedman, William	0	5	0
White, Charles Thomas	0	5	0
Ashton-under-Lyne.			
Arnfield, John C.	0	5	0
Bellfield, William	0	5	0
Bostock, William	0	10	6
Heap, Henry	0	5	0
Knott, E.	0	2	6
Neal, S.	0	2	6
Phillips, John J.	0	5	0
Thatcher, Thomas	0	2	6
Waterhouse, Jabez	0	10	6
Wilson, Samuel	0	2	6
Ashwell.			
Skelton, J. H.	0	5	0
Atherstone.			
Orme, William	0	10	6
Atherton.			
Fletcher, Ellis	0	5	0
Heywood, John H.	0	5	0
Auchterarder.			
Cairnie, Robert	0	2	6
Aylesbury.			
Dickins, Rowland	0	5	0
Palmer, Edwin T.	0	5	0
Turner, John	0	5	0
Badsworth (near Pontefract).			
Heald, Samuel H.	0	10	6
Bakewell.			
Carrington, Edward G.	0	5	0
Thompson, John	0	5	0
Baldock.			
Bally, Edward F.	0	5	0
Banbury.			
Ball, George V.	1	1	0
Bartlett, H.	0	5	0
Gilkes, W. P.	0	10	6
Watts, W.	0	5	0
Banchory.			
Lunan, Alexander	0	5	0
Bangor.			
Baker, Henry V.	0	10	6
Jones, H. L.	0	5	0
Jones, Owen	0	5	0
Roberts, Meshach	1	1	0
Webster, Thomas	0	5	0
Barnard Castle.			
Martin, C. B.	0	5	0
Barnstaple.			
Goss, Samuel	0	5	0
Partridge, James	0	5	0
Pratt, Edward	0	5	0
Symons, William	0	5	0
Barrow-in-Furness.			
Sansom, E.	0	5	0
Barton-on-Humber.			
Ingoldby, William	0	2	6
Smith, Richard F.	0	5	0
Basingstoke.			
Sapp, Arkas	0	10	6
Woodman, George	0	5	0
Bath.			
Bird, F. C. J.	0	2	6
Bright, William	0	5	0
Capper, Edmund	0	5	0
Clarke, B. G.	0	2	6
Commans, Robert D.	0	10	6
Dunn, Richard	0	10	0
Ekin and Appleby	0	10	6
Goodman, D. H.	0	5	0
Griffin, Alfred W.	0	10	6
Hillier, Henry	0	10	6
Marsh, John H.	0	10	6
Masters, Henry James	0	5	0
Merrikin, John B.	0	10	6
Pinch, James E.	0	5	0
Rickwood, Henry	1	1	0
Thomas, Henry J.	0	10	6
Thring, Edmund J. H.	0	10	6
Tilsley, George	0	10	6
Toone, Joseph V.	0	10	6
Vigis, Joseph L.	0	10	6
Williams, Sophia	0	10	6
Wilson, Joseph	0	5	0
Batley.			
Fryer, John (Batley Carr)	0	10	6
Parrington, William	0	5	0
Battle.			
Lemmon, Eric (Hooe)	0	5	0
Beaumaris.			
Slater, John	0	10	6
Bedale.			
Swinbank, J.	0	5	0
Bedford.			
Anthony and Biss	0	10	0
Cameron, William Alexander	0	5	0
Clifford, R. N.	0	5	0
Corrie, A. A.	0	1	0
Corrie, Isabella A.	0	5	0

Bedford—continued.	£	s.	d.
Cuthbert, J. M.	0	5	0
Ekins, John	0	10	6
Hester, Charles	0	5	0
Jones, George	0	5	0
Norman, Joseph S.	0	5	0
Taylor, J. B.	0	5	0
Thompson, H.	0	5	0
Bedford, Leigh.			
Haddock, James	0	5	0
Bedlington.			
Foggan, George	0	5	0
Belfast.			
Green, Thomas	0	5	0
Yoxall, Henry	0	5	0
Belper.			
Bowler, William Samuel	0	2	6
Burkinshaw, W. T.	0	5	0
Calvert, James	0	5	0
Hicking, Joseph	0	2	6
Belvedere.			
Miles, George	0	5	0
Berkeley.			
Bell, Edward Collinson	0	10	6
Berkhamsted.			
Bosher, Alexander	0	2	6
Rippon, R. O.	1	1	0
Berwick.			
Carr, Walter P.	0	5	0
Lyle, William	0	2	6
Beverley.			
James, Kirby	0	10	0
Sheffield, Arthur J.	0	5	0
Bexley Heath.			
Mason, Alfred J.	0	5	0
Bicester.			
Sandiland, R. B.	0	10	6
Bideford.			
Hogg, Thomas	0	5	0
Biggar.			
Eunson, John	0	2	6
Biggleswade.			
Spong, D. M.	0	5	0
Bilston.			
Kearnes, Robert H.	0	5	0
Bingham.			
Doubleday, Frederick	0	5	0
Bingley.			
Skirrow. William E.	0	10	6
Slicer, Walter	0	7	6
Birkenhead.			
Ambler, Thomas	0	5	0
Barber, George	0	10	6
Burroughs, George H.	0	10	6
Dutton, H. O.	0	10	0
Field, H. E.	0	5	0
Fore, Thomas	0	5	0
Foulkes, William James	1	1	0
James, Thomas C	0	5	0
Mullock, Richard	0	10	6
Nicholson, Henry	0	10	6
Stewart, Alexander	0	10	6
Stewart, John	0	10	6
Wilkinson, Samuel	0	5	0
Birmingham.			
Adams, William	0	2	6
Bagshaw, Henry B.	0	10	6
Barker, Thomas	0	10	6
Bird, Alfred	1	1	0
Bradley, T.	0	5	0
Cattell, John T.	0	2	6
Cattell, Thomas B.	0	2	6
Chase, Thomas, jun.	1	1	0
Churchill, Walter J.	1	1	0
Clayton, Francis Corder	1	1	0
Cornforth. Edwin	0	2	6
Drew, John	0	5	0
Foster, Alfred H.	0	5	0
Foster, James Alfred	0	5	0
Frobisher, Frederick	0	5	0
Greatrex, Henry	0	10	6
Holdsworth, Thomas W.	0	10	6
Jacombs, W. H.	0	5	0

Birmingham—continued.	£	s.	d.
Jones, G. M.	0	5	0
Lucas, Joseph	0	10	6
Mantell, Charles	0	10	6
Mantell, Charles, jun.	0	10	6
Midland Counties Chemists' Association	5	5	0
Mott, John C.	0	5	0
Naish, C. E.	0	10	6
Pegg, Herbert	1	1	0
Perry, George E.	0	5	0
Perry, William Henry	0	5	0
Snape and Son	0	10	6
Southall Bros. and Barclay	2	2	0
Thomason, Thomas W.	0	2	6
Thompson, William	0	5	0
Turner, Benjamin	0	2	6
Wakefield, John	1	1	0
Weaver, T.	0	5	0
Wilcox, George	0	10	6
Bishop Auckland.			
Dobinson, Thomas	0	5	0
Harburn, Alfred	0	5	0
Townsend, Thomas F.	0	5	0
Bishop Stortford.			
Hardy, John	0	5	0
Speechly, George	0	10	6
Bishop's Castle.			
Bills, Martha Cam	0	10	6
Blackburn.			
Booth, James	0	10	0
Butterfield, William	0	5	6
Clayton, John W.	0	10	6
Critchley T	0	10	0
Farnworth, William	1	1	0
Garland, A. P.	0	5	0
Hindle, James	0	2	6
Paffard, Frank	0	10	6
Blandford.			
Groves, Mrs. W. E.	1	1	0
Groves, Richard H.	1	1	0
Bodmin.			
Williams, Joel D.	1	1	0
Bognor.			
Long, Alfred T.	0	10	6
Bolsover.			
Thornley, Thomas	0	5	0
Bolton.			
Blain, Alfred Lucas	0	5	0
Blain, William	0	10	6
Forbes, James W.	0	10	6
Hart, James	0	10	6
Mather, James	0	10	6
Bo'ness (N.B.).			
Tweedie, Alexander	0	10	6
Bonnyrigg.			
Hutcheon, W.	0	5	0
Boston (Lincs).			
Allen, Thompson	0	5	0
Cammack, John	0	5	0
Elkington, W. A.	0	2	6
Grimble, Albert	0	5	0
Haller, F. W.	0	5	0
Lawrence, George R.	0	5	0
Lewin, Edward C.	0	5	0
Pilley, Henry T.	0	10	6
Pilley, Samuel	0	10	6
Boulogne (France).			
Parsons, J. Vincett	0	5	0
Bourne (Lincs).			
Mills, Robert M.	0	10	6
Bournemouth.			
Allen, Frederick C.	0	2	6
Atkins, John	0	5	0
Beale, J. H. T.	0	5	0
Callaway, L.	0	10	6
Dobell, Dr. Horace	1	1	0
Duncan, Alexander	1	1	0
Endle, Frederick	0	5	0
Gilbert, William	0	5	0
Hardwick, Stewart	0	10	6
Hazard, James D.	0	5	0
Newbury, Samuel	0	5	0
Shipman, John J.	0	2	6
Spinney, Frank	0	10	6
Taylor, George	0	2	6
Worth, Edwin	1	1	0

Bourton-on-the-Water.	£	s.	d.
Griffin, Henry S.	0	10	6
Bovey Tracey.			
Selleck, W. R.	0	5	0
Bowness-on-Windermere.			
Birkett, Charles	0	5	0
Bradford (Yorks).			
Beanland, Samuel	0	5	0
Blackburn, Bailey	2	2	0
Butterworth, Albert	0	10	6
Cocker, Justus J.	0	5	0
Harrison, Parkinson and Co.	2	2	0
Lister, Simeon (Great Horton)	0	10	6
Pumphrey, Arthur	0	2	6
Rimmington and Sons	1	1	0
Rogerson and Son	2	2	0
Stephenson, Robert	0	5	0
Tempest, Joseph	0	5	0
Watts, John	0	10	6
Bradford-on-Avon.			
Cooper, Albert H.	0	10	6
Braintree.			
Row, George C.	0	2	6
Tarzewell, R.	0	5	0
Brampton.			
Younger and Ridley	0	5	0
Braughing.			
Franklyn, Thomas	0	5	0
Brecon.			
Meredith, John	0	10	0
Bridgend.			
Jenkins, D.	0	5	0
Lloyd, John	0	5	0
Williams, M. (Pencoed)	0	5	0
Bridgnorth.			
Hughes, Hubert	0	5	0
Steward, William	0	10	6
Bridgwater.			
Basker, J. A	0	5	0
Woodward, John L. L.	0	5	0
Bridlington.			
Jackson, Henry J.	0	5	0
Woodliffe, Alfred	0	2	6
Wrack, F. G.	0	2	6
Bridlington Quay.			
Dickins, Mary	0	5	0
Bridport.			
Beach and Barnicott	1	1	0
Beach, James	0	10	6
Jones, Frederick	0	2	6
Brightlingsea.			
Cooper, George B.	0	5	0
Brighton.			
Adams, Frank	0	10	6
Arnold, J.	0	2	6
Barton, Charles	0	10	6
Barton, Henry	0	10	6
Bullen, Thomas	0	10	6
Chambers, Herbert	0	2	6
Chaplin, T. W.	0	5	0
Chapman, F.	0	2	6
Cornish, William	0	5	0
Cox, Arthur H.	1	1	0
Edwards, J.	0	5	0
Else, William	0	10	6
Gibson, W. H.	0	5	0
Glaisyer, Thomas	0	10	6
Grinstead, J.	0	5	0
Guy, Frederick	0	10	6
Gwatkin, James Ross	0	10	6
Hardcastle, S. B.	0	10	6
Harris, E. R.	0	5	0
Hickley, G.	0	10	6
Hornsby, George G.	0	10	6
Jeeves, Thomas	0	10	6
Leigh, Marshall	0	10	6
Long, Henry	0	10	6
Manley, W. F.	0	10	6
Metherell, K.	1	1	0
Padwick, John	0	10	6
Pears, Kilby	0	10	6
Perress, J. C.	0	5	0
Roberts, A. T.	0	5	0
Robson, Thomas	0	10	6
Salmon, E. F.	0	5	0
Salmon, F. W.	0	10	6

Brighton—continued.	£	s.	d.
Savage and Son	1	1	0
Smith, B.	0	5	0
Smith, Walter Henry	1	1	0
Smithson, J.	0	10	6
Vizer, Edwin B.	1	1	0
Walmsley, Robert	0	5	0
Watts, Charles C.	0	10	6
Brill (Bucks).			
Tottenham and Holmes	0	10	6
Bristol.			
Ackerman, Henry	0	10	6
Ackerman, Theophilus	1	1	0
Allen, Benjamin	0	5	0
Bamfield, John	0	5	0
Barton, J. B. (Kingswood)	0	5	0
Bennett, Joseph	0	5	0
Berry, William	0	10	6
Boucher, John	0	10	6
Bramald, F. D.	0	5	0
Butler, Samuel	1	1	0
Cuff, Robert C.	0	5	0
Dibble, J. W.	0	10	6
Freestone, R. H.	0	5	0
Freestone, Thomas M.	0	10	6
Hatch, Richard M.	1	1	0
Hodder, Henry	0	10	6
Howell, Henry	0	5	0
Jennings, Thomas H.	0	5	0
Jones, William W.	1	1	0
Latrobe, Henry	0	5	0
Llewellyn, David	0	2	6
Long, John T.	0	10	6
Moore, J. E.	0	10	6
Newcombe, Robert	0	2	6
Newcombe, William L.	0	2	6
Newman, Robert	0	10	6
Palmer, Frank T.	0	2	6
Pitman, John	1	1	0
Plumley, James G.	0	5	0
Schacht, G. F.	1	1	0
Spill, Thomas	0	10	6
Stroud, John	1	1	0
Towerzey, Alexander	0	10	6
Townsend, Charles	1	1	0
Troake, R. J.	0	10	6
Wade, Thomas T.	0	2	6
Watson, E. M.	1	1	0
Weeks, Albert J. J.	1	1	0
White, James W.	0	10	6
Wretts, John R.	0	10	6
Briton Ferry.			
Jones, Morgan H.	0	5	0
Olive, W. T.	0	5	0
Bromley (Kent).			
Goulden, Herbert	0	5	0
Shillcock, George	0	5	0
Shillcock, Joseph B.	0	10	6
Skinner, Richard	0	5	0
Broseley.			
Norton, Thomas	0	5	0
Brynmawr.			
Evans, Alfred E.	0	5	0
Jones, Alfred M.	0	10	6
Buckingham.			
Kingerlee, George	0	10	6
Burgess Hill.			
Kemp, John	0	10	6
Burnham (Bucks).			
Heald, Alfred	0	10	6
Burnham (Essex).			
Ellis, William	0	5	0
Burnham Market.			
Spencer, William Henry	0	5	0
Burnley.			
Barlow, Joseph A.	0	2	6
Cowgill, Brian H.	0	10	6
Evans, Thomas	0	5	0
Foster, George	0	5	0
Francis, Charles E.	0	5	0
Heaton, Martha	0	2	6
Hitchin, Robert	0	5	0
Holden, John	0	2	6
Munn, Robert	0	5	0
Parkinson, J.	0	5	0

Burnley—continued	£	s.	d.
Parkinson, William	0	5	0
Smith, James Jeremiah	0	2	6
Walker, Sandford	0	5	0
Wilks, Maurice	0	2	6
Wright, John W.	0	5	0
Burntisland.			
Gilmour, Andrew	0	5	0
Burslem.			
Blackshaw Thomas	0	10	6
Guest, George C.	0	2	6
Leicester, Thomas	0	10	6
Oldham, William	0	10	6
Wardle, Thomas	0	2	6
Burton-on-Trent.			
Ottey, Thomas	0	5	0
Wright, George	0	10	6
Bury.			
Bowker, Ellis	0	10	6
Clifton, George F.	0	2	6
Crompton, Alfred	0	5	0
Meadowcroft, James	0	2	6
Wood, Warwick	0	2	6
Bury St. Edmunds.			
Allan, Henry	0	5	0
Brain, F. G.	0	2	6
Count, Sidney	0	2	6
Crassweller, W. E.	0	5	0
Floyd, James	0	5	0
Gross, William	0	2	6
Hardwick, J. E.	0	5	0
Kirkham, Thomas	0	2	6
Last, A. J.	0	2	6
Portway, John	0	2	6
Summers, Frank	0	5	0
Summers, Thos. D.	0	5	0
Youngman, Edward	0	2	6
Buxton (Derbyshire).			
Thresh, Arthur	0	5	0
Thresh, John C.	1	1	0
Caistor.			
Levick, George A.	0	4	0
Cambridge.			
Beall, George	0	5	0
Beall, Samuel S.	0	5	0
Bull, E. J.	0	5	0
Deck, Arthur	0	10	0
Field, Ebenezer	0	5	0
Gillett, C.	0	5	0
Greenwood, Dennis	0	5	0
Hoare, W. P	0	5	0
Lawrence, A. F.	0	2	6
Pain, Walter E.	0	5	0
Throssel, John	0	5	0
Yeomans, John	0	5	0
Canterbury.			
Amos, Daniel	0	10	6
Biggleston, E. R.	0	5	0
Bing, Edwin	0	10	6
Harris, F. R.	0	10	6
Thomas, James (Bridge)	0	5	0
Canton (China).			
Brunt, G. H.	0	10	6
Cardiff.			
Anthony, David	0	5	0
Coleman, Alfred	0	5	0
Coleman, E. J.	0	10	6
Collier, J. A.	0	5	0
Davies, Ifor	0	5	0
Drane, Robert	0	10	6
Furnival, William	0	5	0
Greaves, John	0	5	0
Hagon, Albert	0	5	0
Hicks, W. T.	0	5	0
Howell, Thomas	0	5	0
Jones, D. A.	0	2	6
Jones, J. A.	0	5	0
Jones, John T.	0	5	0
Joy, F. J. J.	0	5	0
Lloyd, David	0	5	0
Mumford, Richard	0	5	0
Munday, John	0	5	0
Phillips, John	0	2	6
Prust, Richard	0	5	0
Robb, John	0	5	0
Roberts, William (Pontlottyn)	0	2	6
Williams, Thomas	0	10	6
Williamson, J. E.	0	5	0
Yorarth, T. B.	0	5	0

Carlisle.	£	s.	d.
Bell, John	0	5	0
Fisher, Catherine Hodgson	0	5	0
Foster, James	0	5	0
Hallaway, John	0	5	0
Parker, Edward J.	0	5	0
Parker, William	0	5	0
Richardson, Thomas J.	0	2	6
Robson, John	0	5	0
Thompson, Andrew	0	10	6
Todd, Joe	0	5	0
Carluke.			
Hinksman, John	0	5	0
Carmarthen.			
Davies, Richard Morgan	0	5	0
Smith, John H.	0	5	0
Carnarvon.			
Jones, John	0	5	0
Lloyd, William	0	5	0
Carshalton.			
Carter, Francis	0	10	6
Castle Douglas.			
Veitch, A.	0	5	0
Castle Hedingham.			
Foulsham, H. B.	0	5	0
Chapel Allerton.			
Saville, William	0	5	0
Chard.			
Churchouse, W. B.	0	5	0
Woodland, W. F.	0	5	0
Charlestown-of-Aberlour.			
Smith, John	0	2	6
Chatham.			
Crofts, Holmes C.	0	10	6
French, Miss	0	10	6
Lamb, Thomas C.	0	5	0
Thompson, George Alfred	0	5	0
Tribe, John	0	10	6
Chatteris.			
Langman, Peter	0	2	6
Chelmsford.			
Baker, Gerrad	0	10	6
Metcalfe, Wilson	0	10	6
Tomlinson, James	0	10	6
Cheltenham.			
Balcomb, John	0	10	6
Barron, William	0	10	6
Beetham, M.	0	10	6
Board, Thomas F.	0	5	0
Butcher, Thomas	1	1	0
Dolman, William	0	5	0
Dunn, Geo. S.	0	2	6
Fletcher and Palmer	1	1	0
Flooks, George	0	5	0
Godsell, Philip G.	0	5	0
Hands, William	0	5	0
James, Joseph	0	5	0
Jeffrey, Thomas A.	0	10	6
Klte, W. T.	0	5	0
Macdonald, E.	0	2	6
Mansbridge, M. C.	0	10	0
Milne, Alexander	0	2	6
Moore, Edward	0	2	6
Pattison, Thomas	0	10	6
Power, J. H.	0	5	0
Prockter and Forth	1	1	0
Purnell, Henry A.	0	5	0
Seys, Frederick A.	0	2	6
Shaw, Alexander H.	1	1	0
Smith, Nathaniel and Co.	1	1	0
Smith, William H.	0	5	0
Thompson, Thomas L.	0	2	6
Tudor, William	0	5	0
Walters, John	0	10	0
Wilkins, Henry	0	5	0
Wilson, John S.	0	5	0
Wood, Frederick	0	5	0
Woodward, Solomon	0	10	6
Chepstow.			
Tame, Thomas	0	5	0
Chertsey.			
Boyce, George	0	5	0
Chesham.			
Mackaness, Charles	0	10	6

Chester.	£	s.	d.
Baxter, George	0	10	6
Grindley and Son	0	10	6
Guy, John (Boughton)	0	5	0
Hodges, William	0	10	6
Hope, John	0	5	0
Huke, James W.	0	5	0
Mills, John	0	5	0
Shrubsole, G. W.	0	5	0
Chesterfield.			
Barfoot, J. R. D.	0	2	6
Booth, George	0	10	6
Elliott, Thomas	0	5	0
Furness, Thomas	0	2	6
Greaves, A. W.	0	5	0
Greaves, Wm. S.	0	10	6
Lancaster, Wm. G.	0	5	0
Lowe, A.	0	5	0
Sampson, George	0	2	6
Windle, John T	0	5	0
Chester-le-Street.			
Longbotham, Joseph	0	5	0
Greenwell, Richard Henry	0	10	6
Chew-Magna.			
Milton, Thomas	0	5	0
Chichester.			
Baker and Son	0	10	6
Batchelor, C. J. H.	0	5	0
Ellidge, John W.	0	10	6
Chippenham.			
Coles, John C.	0	10	6
Turpin, A. B.	0	5	0
Chipping Ongar.			
Chapman, Richard J.	0	10	6
Ward, David	0	10	6
Chipping Sodbury.			
Jones, Richard	0	10	6
Chislehurst.			
Scrase, Richard	0	5	0
Wing, Lewis	0	10	6
Chorley.			
Hill, William	0	5	0
Christchurch.			
Green, John	0	5	0
Chulmleigh.			
Joint, Robert James	0	6	0
Cirencester.			
Griffiths, Waldron	0	10	6
Kinch, Edward	0	10	6
Smith, Charles S.	1	1	0
Claycross.			
Lloyd, Robert	0	10	6
Smith, John	0	5	0
Clevedon.			
Evans, Evan J.	0	5	0
Stewart, James	0	10	6
Clun.			
Darroll, William	0	10	6
Cockermouth.			
Bowerbank, Joseph	1	1	0
Brown, R. F.	0	2	6
Cooper Brothers	0	2	6
Robinson, William	0	5	0
Straughton, Joseph	0	2	6
Codnor (near Derby).			
Farnsworth, Thomas	0	5	0
Colchester.			
Bates, Thomas W.	0	5	0
Cole, Fred A.	0	5	0
Cordley, W. B.	0	5	0
Hammerton, Edward	0	5	0
Prosser, Mrs.	0	5	0
Shenstone, J. C.	0	5	0
Simpson, Hales	0	5	0
Weddell, Arthur	0	5	0
Colombo (Ceylon).			
Davidson, P.	0	5	0
Congleton.			
Cole, Frederick	0	5	0
Goode, Charles	0	5	0
Connah's Quay.			
Jones, Kendrick L.	0	2	6
Corris.			
Thomas, Maurice	0	5	0
Corwen.			
Jones, William	0	10	6
Coventry.			
Bird, Frederick	0	5	0
Brown, John	0	2	6
Clarke, William	0	2	6
Foote, A. H.	0	2	6
Glover, Henry	0	2	6
Hinds, James	0	10	6
Loveitt, Thomas	0	2	6
Marston, James	0	2	6
Mason, D.	0	2	6
Newton, Alfred H.	0	2	6
Sellors, Thomas	0	2	6
Summer, James	0	10	6
Wyleys and Co.	1	1	0
Cowbridge.			
Thomas, John	0	5	0
Cowes (Isle of Wight).			
Beavan, George A.	0	10	6
Fennings, Alfred	1	0	0
Cradley Heath.			
Bishop and Wooldridge	0	10	6
Cranbrook.			
Turner, John	0	5	0
Crawley.			
Leach, John	0	5	0
Webb, W. J.	0	5	0
Weedon, Joseph	0	5	0
Crediton.			
Jackson, William	1	1	0
Crewe.			
Bayley, William	0	10	0
Harrop, William H.	0	5	0
Crewkerne.			
Catford, O. W.	0	5	0
Criccieth.			
Bowen, Joseph W.	0	2	6
Cromer.			
Priest, Edward R.	0	10	6
Croydon.			
Andrews, J. W.	0	5	0
Barritt, George	0	10	6
Clarke, Josiah	0	10	6
Harwood, Charles	0	5	0
Hayward, George	0	10	0
Long, Henry	0	10	6
Padwick, W. G.	0	5	0
Roberts, D. P.	0	10	6
Stannard, Frederick John	0	10	6
Cullen, N.B.			
Seivwright, George	0	5	0
Dalton-in-Furness.			
Preston, William L.	0	5	0
Darlington.			
Best, George	0	5	0
Best, J. W.	0	5	0
Coatsworth, Thomas	0	5	0
Cranston, John	0	5	0
Nicholson, Richard	0	5	0
Raw, James H.	0	5	0
Robinson, James	0	5	0
Swenden, James	1	1	0
Walton, Frederick G.	0	2	6
Dartford.			
Cottingham, Joseph J.	0	5	0
Wilson, R. E.	0	5	0
Dartmouth.			
Humphrey, Horatio	0	10	6
Rees, William H.	0	5	0
Deal.			
Green, John	0	10	6
Denbigh.			
Edwards, William	0	5	0
Denton (Lancs).			
Arrandale, William	0	10	6
Derby.	£	s.	d.
Bishop, E. J.	0	2	6
Blunt, W. B.	0	5	0
Clifton, Frederick	0	10	6
Cope, J. A.	0	5	0
Dickinson, David	0	2	6
Frost, George	0	10	6
Goodall, Henry	0	5	0
Monkhouse, Henry	0	5	0
Nicklinson, Thomas	0	5	0
Scholes, James S.	0	5	0
Stevenson, Richard W.	0	5	0
Devizes.			
Clark, Robert	0	10	6
Edwards, T. R.	0	2	6
Devonport.			
Codd, Francis	0	5	0
Kent, B. J.	0	5	0
Lamble, John A.	0	2	6
Dewsbury.			
Walker, George	0	5	0
Didcot (Berks).			
Sadgrove, Arthur A.	0	5	0
Didsbury.			
Bates, John F.	0	5	0
Richardson, Allen	0	5	0
Diss.			
Cadge, John	0	5	0
Cupiss, Francis	0	10	6
Gostling, T. P.	0	10	6
Gostling, W. A.	0	10	6
Humphries, C. J.	0	5	0
Muskett, Charles	0	5	0
Thrower, Edward A.	0	10	6
Whitrod, H. F.	0	5	0
Doncaster.			
Atkinson, Stephen (Arksey)	0	10	6
Cooper, C. C. Cocking	0	5	0
Dunhill and Stiles	1	1	0
Hasselby, Thomas J.	0	5	0
Hopper, Charles	0	5	0
Hough, William	0	5	0
Howorth, James	0	10	6
Parkin, Charles	0	5	0
Pickering, John (Crowle)	0	5	0
Shaw, H. W.	0	5	0
Walker, E. H.	0	10	0
Dorchester.			
Durden, H.	0	5	0
Emson, W. N.	0	5	0
Evans, Alfred J.	0	5	0
How, William	0	5	0
Pearce, William L.	0	5	0
Watts, E. P.	0	5	0
Dorking.			
Clark, W. W.	0	10	6
Mount, James	0	2	6
Douglas (Isle of Man).			
Brearey, A. W.	0	10	6
Brearey, Wm. A.	1	1	0
Gore, J. R. A.	0	5	0
Dover.			
Adams, R. W.	0	5	0
Barnes, William James	0	5	0
Bolton, J.	0	5	0
Bottle, Alexander	1	1	0
Brown, Joseph Fred.	1	1	0
Cotterell, W. B.	0	2	6
Dickeson, Richard	1	1	0
Ewell, Richard M.	0	5	0
Forster, Robert Henry	0	10	6
Hambrook, John Barber	0	5	0
Killick, C. R.	0	5	0
Leigh, H. M.	0	2	6
Peake, Henry	0	10	6
Thompson, Edward	0	10	6
Wyles, William	1	1	0
Dresden.			
Walker, Thomas D.	1	1	0
Driffield.			
Bordass, James	0	5	0
Droitwich.			
Sandiland, R. B., jun.	0	5	0
Dublin.			
Bowles, Charles A.	0	10	6
Scott, Walter	0	5	0
Dudley.			
Green, William	0	2	6
Thompson, John W. (Sedgley)	0	10	6

Dufftown (N.B.).	£	s.	d.
Sangster, William	0	5	0
Dumbarton.			
Babtie, John	0	5	0
Campbell, Colin	0	5	0
Dumfries.			
Allan, William	0	10	6
Dundee.			
McMillan, James	0	10	6
Dunfermline.			
Gilmour, David	0	2	6
Seath, Alexander	0	10	6
Dunse.			
Veitch, James	0	10	6
Durham.			
Bowman, S.	0	2	6
Burdon, John	0	10	6
Burn, B. P.	0	2	6
Castle, John W.	0	2	6
Leighton, Mrs	0	10	6
Palmer, John G.	0	2	6
Rollin, John G.	0	10	6
Sarsfield, John	0	2	6
Sarsfield, William	0	10	6
Scawin and Burn	0	10	6
Stangroom, A. (Whissonsett)	0	2	6
Ealing.			
Barry, Thomas S.	0	10	6
Hayles Brothers	1	1	0
Earlstown.			
Hogg, Andrew	0	2	6
Peake, Arthur	0	5	0
Eastbourne.			
Andrews, J. F.	0	5	0
Brown, Henry R.	1	1	0
Crook, Herbert	1	1	0
Cullingford, L. J.	1	1	0
Gibbs, Joseph	1	1	0
Hall, Samuel	1	1	0
Harmar, A. D.	0	5	0
East Dereham.			
Smith, William	0	5	0
East Grinstead.			
Dixon, W. H.	0	2	6
Eastwood.			
Cherrington, B.	0	10	6
Eccleshall.			
Smith, Edgar R.	0	5	0
Edinburgh.			
Adamson, W. S.	0	2	6
Amslie, Wm. W.	0	2	6
Aitken, James	0	5	0
Aitken, Robert	0	5	0
Aitken, William	0	5	0
Allan, William	0	10	6
Arthur, Charles	0	5	0
Baildon, Henry B.	1	1	0
Boa, Peter	0	5	0
Brown, Robert	0	5	0
Brown, Robert S.	0	5	0
Bruce, Alexander G.	0	5	0
Buchanan, James	1	1	0
Chemists' Assistants' Association	1	1	0
Clark, William Inglis	0	10	6
Coates, Edwin	0	10	0
Coates, J. T.	0	2	6
Cowie, George	0	3	0
Crow, William	0	5	0
Dewar, F. L.	0	5	0
Dick, Robert	1	1	0
Dick, Robert Gibson	0	5	0
Dott, David B.	0	5	0
Dunlop, J. B.	0	5	0
Ewing, James L.	0	10	0
Fidler, T. W.	0	5	0
Forret, John A.	0	5	0
Fraser, J. I.	0	5	0
Gamley, David	0	5	0
Gardner and Ainslie	1	1	0
Gilmour, William	1	1	0
Gorrie, Daniel	0	5	0
Gray, E. H.	0	2	6
Hannay, L. W. C.	0	10	6
Heron, James	1	1	0
Kennedy, Adam	0	10	0
King, William	0	2	6
Laird, George H.	0	5	0
Leitch, William	0	10	6
Leith, James	0	2	6
Lockerbie, James	0	5	0
MacAlley, Robert	0	5	0
McCulloch, T. T.	1	1	0
Macdonald, Alexander	0	2	6
Macdonald, John	0	5	0
MacEwan, Peter	0	5	0
Macfarlan and Co.	2	2	0
Macfarlane, Andrew Y.	0	7	6
McGlashan, J.	0	5	0
Mackay, George D.	1	1	0
Mackenzie, James	0	10	6
Maclagan, James	0	5	0
MacLaren, David	0	5	0
McPherson, Colin A.	0	5	0
Marshall, James	0	2	6
Morison, John	0	10	6
Napier, Alexander	0	10	6
Noble, Alexander	1	1	0
Pinkerton, William	0	10	6
Pottage, J. C.	0	10	6
Prentice, John	0	5	0
Purves, Samuel	0	5	0
Radford, George	0	5	0
Raimes, Blanshard and Co.	2	2	0
Reid, James	0	5	0
Ritchie, J.	0	5	0
Robertson, J.	0	5	0
Robertson and Co.	1	1	0
Scobie, James	0	5	0
Scott, James	0	10	6
Smiles, James	0	5	0
Smith, Thomas	1	1	0
Smith, William	0	5	0
Spence, William	0	5	0
Stephenson, Frederick	0	5	0
Stephenson, J. B.	0	10	6
Steward, A. K.	0	2	6
Stoddart, T. G.	1	0	0
Suttar, John	0	2	6
Symington, Thomas	0	5	0
Thomson, Robert	0	10	0
Wylie, David N.	0	2	6
Edmonton.			
Ragg, William	1	1	0
Ragg, William W.	0	10	0
Egham.			
Bartholomew, William	0	10	6
Egremont (Cheshire).			
Hallawell, Joseph	1	1	0
Elgin.			
Robertson, William	0	5	0
Young, John	0	5	0
Ely.			
Heading, H. H.	0	10	6
Lincoln, William	0	10	6
Pate, Henry T.	0	10	6
Empingham.			
Johnson, F. E.	0	5	0
Emsworth.			
Waters, Henry Griffith	0	10	6
Waters, William A.	0	5	0
Epping.			
Rowland, Thos.	0	10	6
Rowland, T. W.	0	2	6
Epsom.			
Oxley, Frederic	0	5	0
Erith.			
Oldfield, Henry	0	10	6
Eton.			
Lewis, C.	0	5	0
Evesham.			
Dingley, R. L.	0	5	0
Pumphrey, John, and Son	0	5	0
Exeter.			
Bard, Jane	0	2	6
Brailey, Charles	0	5	0
Bromfield, Charles	0	5	0
Broom, W. W.	0	5	0
Bulley, William H.	0	2	6
Cooper, George	0	10	6
Fouraker, Thomas E.	0	5	0
Gadd, Henry	0	10	6
Harris, Henry W.	0	10	6
Hunt, Arthur	0	10	6
Lake, John H.	0	10	6
Milton, Thomas C.	0	5	0
Napier, George L.	0	5	0
Pasmore, George	0	5	0
Sanders, W. F.	0	2	6
Stone, Frederick W.	0	10	6
Tighe, Henry W.	0	5	0
Topham, John Samuel	0	10	6
Eye.			
Bishop, Robert	0	10	6
Eynsham.			
Howe, Henry A.	0	5	0
Falkirk.			
Lyon, Thomas	0	10	6
Murdoch, David	0	10	6
Falmouth.			
Newman, Walter F.	0	5	0
Solomon, W. H.	0	10	6
Wilmer, F. J.	0	5	0
Fareham.			
Batchelor, Alfred E.	0	5	0
Batchelor, Charles	0	5	0
Franklin, Alfred	0	5	0
Faringdon.			
Ballard, Arthur	0	10	6
Farnham.			
Griffiths, J.	0	10	6
Faversham.			
Lenfestey, W. G.	0	5	0
Mundy, William F.	0	2	6
Fenton.			
Massey, Stephen	0	5	0
Weston, Joseph	0	2	6
Fife Keith.			
Dawson, J. H.	0	2	6
Filey.			
Robson, John Binnington	0	5	0
Fishguard.			
Vaughan, William	0	2	6
Flint.			
Jones, Michael	0	5	0
Jones, O. W.	0	5	0
Folkestone.			
Giles, John J.	0	10	6
Goodliffe, George	0	10	6
Lea, Frederick J.	0	5	0
Lea, John	0	10	6
Stainer, John	0	10	6
Foots Cray.			
Baker, William R.	0	5	0
Fordingbridge.			
Haydon, Frederick W.	0	5	0
Forfar.			
Ranken, James A.	0	5	0
Ranken, John	0	5	0
Fortune's Well.			
Grant, Donald	0	5	0
Fraserburgh.			
Burnett, Robert	0	5	0
McDonald, James	0	10	0
Freshwater (Isle of Wight).			
Wellington, Henry A.	0	5	0
Fyvie (N.B.)			
Bremner, James	0	5	0
Gainsborough.			
Forrest, Richard Wm.	0	10	6
Marshall, John Ferris	0	10	6
Galashiels.			
Noble, Alexander	0	5	0
Ross, William	0	5	0
Garstang.			
Thomas, J. J.	0	5	0
Garston.			
Lloyd, T. E.	0	5	0

Gateshead-on-Tyne.	£	s.	d.
Clarke, T. W.	0	10	0
Elliott, Robert	0	10	6
Greenwell, William C.	0	5	0
Prosser, Thos. W.	0	2	6
Smith, E. B.	0	2	6
Gedney.			
Harrison, William	0	5	0
Glasgow.			
Adams, John	0	10	6
Brodie, Robert	0	5	0
Clarke, Joseph A.	0	10	6
Crocher, Joseph	0	7	6
Currie, John	0	5	0
Currie, William L.	0	5	0
Dickie, James	0	10	6
Dunlop, Thomas	0	5	0
Fenwick, John	0	5	0
Flint, C. B.	0	10	6
Foster, John	0	5	0
Frazer, Daniel	1	1	0
Glasgow Apothecaries' Co.	1	1	0
Glen, Robert	0	5	0
Greig, William	0	10	6
Harrower, Peter	0	5	0
Henderson, John	0	5	0
Illingworth, George S.	0	5	0
Jaap, John	0	10	6
Kinninmont, Alexander	0	10	6
Kitchen, James	0	2	6
Lambie, Hugh	0	5	0
Lawrence, John	0	10	6
McMillan, John	0	10	6
McNichol, John	0	5	0
Murdoch Brothers	0	10	6
Paris, Walter	0	5	0
Peacock, John R.	0	2	6
Pettigrew, John W.	0	4	0
Pinkerton, John S.	0	10	0
Rose, Alexander	0	10	6
Simpson, William	0	5	0
Thompson, M. F.	0	5	0
Twaddle, Robert	0	5	0
Wallace, William	0	10	6
Ward, William A.	0	5	0
Whitelaw, James	1	1	0
Glass (N.B.).			
Aberdein, James	0	2	0
Glastonbury.			
Hulbert, S. J.	0	2	6
Gloucester.			
Berry, Edward	0	5	0
Franklin, James	0	5	0
Hughes, Evan G.	0	5	0
Jenkins, Henry	0	5	0
Meadows, Henry	0	10	6
Sadleir, John	0	10	6
Skinner, Thomas	0	10	6
Stafford, William	0	10	6
Trigg, James W.	0	5	0
Trotman, A. C.	1	1	0
Ward, Joseph	0	10	6
Godstone.			
Horner, James T.	1	1	0
Gorleston.			
Thurlby, George	0	2	6
Gorton.			
Plant, Frank G. L.	0	5	0
Gosforth.			
Gaitskell, James	0	5	0
Gosport.			
French, Benjamin	0	10	6
Hunter, John	0	10	6
Mason, Philip H.	1	1	0
Mumby, Charles	0	10	6
Mumby, Charles J. E.	0	10	6
Smith, W. B.	0	5	0
Govan.			
Skinner, John	0	5	0
Graaff Reinet (Cape Colony).			
Tebb, Henry	1	1	0
Grantham.			
Cooper, H. G.	0	5	0
Gibson, John B.	0	10	0
Hall, R. A.	0	10	6
Stewart, James	0	2	6
Whysall, William	0	10	6
Grantown (N.B.).			
Duncan, William	0	2	6
Gravesend.			
Bulgin, William	0	5	0
Clarke, Richard F.	0	5	0
Lucas, Joseph M. M.	0	5	0
Mitchell, Mrs.	0	2	6
Spencer, Charles	1	1	0
Great Bedwyn.			
Gerard, George R.	0	10	6
Great Grimsby.			
Cook, Robert, jun.	0	5	0
Gossop, George K.	0	5	0
Mason, William D.	0	2	6
Robinson, Jonathan Scott	0	2	6
Great Malvern.			
Fox, T.	0	2	6
Hanson, Christopher	0	2	6
Johnson, Thomas S.	0	10	6
Metcalfe, Edmund Henry	0	10	6
Shephard, W. A.	0	5	0
Great Warley.			
Hayes, James	0	5	0
Greenhithe.			
Cox, Edwin J.	0	5	0
Guernsey.			
Arnold, Adolphus	0	10	6
Cumber, Henry	0	2	6
Guildford.			
Burton, William	0	5	0
Jefferies, Henry	1	1	0
Martin, Edward W.	0	10	6
Thompson, Thomas	0	5	0
Wheeler, Frederick	0	5	0
Guisborough.			
Fairburn, Robert W.	0	5	0
Haddington.			
Watt, James	0	5	0
Hailsham.			
Jenner, Charles U.	0	2	6
Halesworth.			
Gostling, John H.	0	5	0
Halifax.			
Brook, Robert	0	10	6
Dyer, William	0	5	0
Jessop, Jonathan	0	5	0
Swire, Jabez	0	5	0
Halstead.			
Hoddy, Benjamin	0	2	6
Hanley.			
Insull, E. S.	0	2	6
Moore, John William	0	5	0
Smith, Arthur H.	0	10	6
Tirrell, John	0	5	0
Harleston.			
Muskett, James	0	10	0
Woods, Charles	0	5	0
Harrogate.			
Coupland, Joseph	0	10	6
Davis, Richard H.	0	10	6
Greenwood, Charles	0	10	6
Greenwood, John	0	10	6
Mather, J. H.	0	5	0
Taylor, Joseph H.	0	10	6
Harrow.			
Chesterfield, T. M.	0	2	6
Harrow Weald.			
Blackwell, S. J.	2	2	0
Hartlepool.			
Emmerson, C.	0	10	6
Jackson, William George	1	1	0
Pattrick, George	0	10	6
Harwich.			
Bevan, Charles F.	0	10	6
Harding, Joseph	0	5	0
Worts, Augustine	0	5	0
Haslingden.			
Blayney, Joseph J.	0	5	0
Hastings.			
Amoore, Charles	0	5	0
Beck, Albert N.	0	5	0
Bell, J. A.	0	10	6
Bolton, Thomas	0	5	0
Jameson, W. E.	1	1	0
Kernot, Dr. G. C.	0	10	6
Keyworth, G. A.	0	10	0
Mackenzie, Chas. A.	0	5	0
Rossiter, Frederick	0	5	6
Snowdon, Robert	0	5	0
Haverfordwest.			
Jenkins, Jabez (Lysyfran)	0	5	0
Saunders, Charles P.	0	5	0
Saunders, David P.	0	10	6
Hawick.			
Blaine T. J. S.	0	5	0
Craig, John	0	5	0
Maben, Thomas	0	5	0
Hawkhurst.			
Corke, Edward	0	5	0
Pridgeon, W. J.	0	5	0
Hay.			
Davies, John Lutwiche	0	5	0
Hebburn.			
Puttuck, Fredk. W.	0	4	0
Hebden Bridge.			
Hey, David	0	10	6
Hey, Thomas K.	0	10	6
Lawton, John D.	0	5	0
Heckington.			
Sumners, Michael Cole	0	5	0
Heckmondwike.			
Booth, John	1	1	0
Stephenson, James N.	0	5	0
Helensburgh.			
Harvie, George	0	5	0
Helmsdale.			
Fraser, John	0	2	6
Helston.			
Troake, M. H.	0	10	6
Wakeham, Charles	0	5	0
Hemel Hempstead.			
Argue, James	0	5	0
Henley-on-Thames.			
Hunn, Benjamin	0	5	0
Hereford.			
Walker, John	0	10	6
Williams, W. and H. B.	0	10	6
Hertford.			
Aldridge, J. H.	0	5	0
Lines, George	0	5	0
Wilshaw, Samuel T.	0	10	6
Hexham.			
Gibson, J. P.	1	1	0
Richardson, George	0	5	0
Riddle, W. R.	0	5	0
Heywood.			
Beckett, William	0	10	6
Mills, W. H.	0	5	0
Hirwain.			
Sims, Joseph	0	10	6
Hitchin.			
Pearson, W. J.	0	2	6
Perks and Llewellyn	1	1	0
Ransom, William	1	1	0
Hoddesdon.			
Green, William G.	0	5	0
Whitmore, W. F.	0	2	6
Holywell.			
Carman, John	0	5	0
Jones, Samuel	0	5	0
Horley.			
Philp, Joseph	0	10	6
Horncastle.			
Betts, William	0	5	0
Carlton, E. P.	0	5	0
Horndean.			
Bettsworth, Henry T.	0	5	0

Horsforth.	£	s.	d.
Wynn, Frederick	0	10	6
Horsham.			
Williams, Philip	0	5	0
Wood, Edward	0	10	6
Huddersfield.			
Higgins, Tom Sellers	0	10	6
Kaye, Hamor	0	5	0
King, William	0	10	6
Macaulay, W. H.	0	10	6
Swift, C. H.	0	5	0
Sykes, Henry	0	5	0
Wheatley, Charles	0	10	6
Hull.			
Allison, E. and H.	1	1	0
Baynes, James	0	10	6
Bell, Charles B.	1	1	0
Bousfield, —	0	5	0
Burnett, W.	0	2	6
Campbell, Charles	0	5	0
Chapman, E.	0	5	0
Chapman, Joseph	0	2	6
Creasser, Matthew	0	5	0
Desforge, J. H.	0	5	0
Dobson, J. B.	0	5	0
Dyson, George	0	5	0
Earle, Francis	1	1	0
Fowler, Edwin	0	5	0
Gibson, C. P. (Trustees of)	0	5	0
Goldsmith, William	0	5	0
Gregory, Mrs.	0	2	6
Grindell, John	0	10	6
Hall, Henry R. F.	0	5	0
Hammond, William H.	0	5	0
Hart, George William	0	10	6
Hay, W.	0	2	6
Hebblethwaite, G. A.	0	2	6
Hollingsworth, James	0	5	0
Hoyles, George	0	2	6
Linford, John S.	1	1	0
Lofthouse and Saltmer	1	1	0
Loten, W. L.	0	5	0
Milner, John G.	0	5	0
Myers and Saunders	0	10	6
Oldham, James	0	5	0
Parsons H. J.	0	2	6
Price, W.	2	2	0
Shaw, Ward	0	5	0
Shepherdson, Welburn	0	10	6
Snape, E.	0	5	0
Souter, Jas. S.	0	10	6
Staning, Walter	0	5	0
Stoakes, Benjamin M.	0	5	0
Hunstanton.			
Twiss, Wm.	0	10	6
Huntingdon.			
Baxter, Robert	0	10	6
Huntly (N.B.).			
Chalmers, G.	0	2	6
Hurstpierpoint.			
Hudson, Alfred W.	0	2	6
Hyde.			
Oldfield, Henry	0	10	6
Hyères (France).			
Powell, Walter A.	0	5	0
Hythe.			
Lemmon, R. A.	0	7	6
Idle.			
Hopton, Edwin	0	5	0
Ilfracombe.			
Crang, Walter	0	10	6
Ilkeston.			
Potts, Charles	1	1	0
Ilkley.			
Worfolk, George William	0	5	0
Ilminster.			
Callander, W. W.	0	5	0
Ingatestone.			
Stuart, Henry James	0	2	6
Invergordon.			
Sinclair, Robert	0	5	0
Inverness.			
Galloway and Son	0	10	6
MacRitchie, David	0	5	0
Ogston, William	0	5	0
Ipswich.			
Anness, Samuel R.	0	10	6
Chapman and Pain	0	10	6
Christopher, Fred.	0	5	0
Clifton, E. S.	0	5	0
Cornell, William	1	1	0
Cossey, James D.	0	5	0
Eyre, Henry R.	0	5	0
Grimwade, Ridley and Co.	0	10	6
Lyon, Robert	0	5	0
Matcham, Edward	0	5	0
Miller, T. T.	0	5	0
Pain, Arthur	0	5	0
Spurgeon, Fredk. J.	0	5	0
Younger, Robert E.	0	5	0
Irvine.			
Gillespie, James	0	5	0
Isleworth.			
Reece, James	0	5	0
Jamaica.			
Marshall, C. W.	0	5	0
Jarrow-on-Tyne.			
Huckebridge, J. M., jun.	0	5	0
Jedburgh.			
Peters, J. F.	0	5	0
Jersey.			
Baker, John T.	0	5	0
Cole, George	0	10	6
Ereaut, John, jun.	1	1	0
Millais, Mrs.	1	1	0
Miller, Henry	0	5	0
Keighley.			
Edwards, F. W.	0	5	0
Kemberton.			
Guy, William A.	1	1	0
Kendal.			
Bateson, Thomas	1	1	0
Burton, Matthew	1	1	0
Hind, Thomas W. L.	1	1	0
Severs, Joseph	1	1	0
Kenilworth.			
Barton, Henry Emlyn	0	10	6
Keswick.			
Swindle, Norman V.	0	5	0
Townley, Thomas	0	10	6
Kettering.			
Denston, John Thomas	0	5	0
Thursfield, John F.	0	5	0
Kidsgrove.			
Griffiths, Edwin H.	0	10	6
Kilmarnock.			
Borland, John	1	1	0
Borland, John, jun.	0	10	6
Kimberley (South Africa).			
Helmore, W. H.	0	5	0
King's Lynn.			
Atmore, George	0	5	0
Betts, George	1	1	0
Cocher, John A.	0	5	0
Kingston-on-Thames.			
Bond, C. R.	0	10	6
Brewster, William	0	10	6
Higgs, Alfred	0	5	0
Walmsley, Samuel	0	5	0
Whaley, Edward	1	1	0
Kingstone.			
Ackrill, George	0	10	6
Kington.			
Venables, Samuel H.	0	5	0
Kirkby Stephen.			
Armstrong, J.	0	5	0
Kirkcaldy.			
Storrar, David	1	1	0
Knaresborough.			
Potter, Charles	0	5	0
Thompson, John H.	0	5	0
Kurrachee (India).			
Brown, Leonard H.	0	8	6
Lahore (India).			
Inglis, W. K.	0	5	0
Lancaster.			
Arkle, William	0	5	0
Bagnall, W. H.	0	5	0
Fell, John J.	0	5	0
Hall, W.	0	5	0
Holmes, Edward (Bentham)	0	5	0
Suart, George	0	5	0
Troughton, Henry	0	5	0
Vince, James	0	5	0
Landport.			
Alderslade, William	0	5	0
Hackman, Leonard L.	0	10	6
Perfect, George	0	5	0
Langholm.			
Beattie, Thomas	0	5	0
Langport.			
Chant, Herbert A.	0	10	6
Largs (N.B.).			
Fraser, Alexander	0	5	0
Launceston.			
Downing, Frederick	0	5	0
White, Thomas	0	10	6
Leamington.			
Barnitt, John	0	10	6
Barrett, Josephus T.	1	1	0
Bloomfield, E. J.	0	2	6
Clague, T. Maltby	0	2	6
Clower, John	0	5	0
Davidge, H. E. F.	0	2	6
Davis, Benjamin	0	5	0
Davis, Henry	1	1	0
Holloway, E. A.	0	2	6
Jones, L. J. W.	0	2	6
Long, E. A.	0	2	6
Newby, Charles A.	1	1	0
Pullin, William H.	0	10	6
Sansom, Henry	0	10	6
Skidmore, John	0	2	6
Smith, Samuel A.	1	1	0
Smith, Samuel H.	0	5	0
Spilsbury, James	0	5	0
Stanley, Herbert	0	10	6
Taylor, E. H.	0	2	6
Thornton, Edward	0	5	0
Leatherhead.			
Waugh, Mrs. Alexander	0	10	6
Lechlade.			
Ballard, Edwin	0	5	0
Ledbury.			
Freeman, Ernest	0	10	6
Leeds.			
Archer, Joseph S.	0	2	6
Bilbrough, Joseph B.	0	10	6
Bottomley, A. F.	0	5	0
Branson, F. W.	0	10	6
Cole, E. H.	0	5	0
Exley, George	0	5	0
Fawthorp, James	0	5	0
Ferguson, William K.	0	10	6
Goodall, Backhouse and Co.	2	2	0
Hardcastle, John	0	5	0
Harvey, Thomas	1	1	0
Hirst, Brooke and Hirst	2	2	0
Hirst, David	0	5	0
Iredale, Thomas	0	5	0
Jefferson, Peter	0	10	6
Morgan, Edward	0	5	0
Pierson, Clement	0	5	0
Reynolds, Richard	1	1	0
Smeeton, William	0	10	6
Taylor and Fletcher	1	1	0
Taylor, Samuel	1	1	0
Woolford, James	0	5	0
Leek.			
Blades, Josiah B.	0	2	6
Holdcroft, E. J.	0	2	6
Johnson, William	0	5	0
Leicester.			
Berridge, Alfred	0	5	0
Broof, R.	0	10	6
Burford, S. F.	0	5	0
Butler, E. H.	0	5	0
Butler, J. A.	0	5	0
Butler, T. E.	0	5	0

Leicester—continued.	£	s.	d.
Cadoux, S. K.	0	5	0
Carr, William	0	10	0
Clark, E. A.	0	5	0
Clark, John W.	2	2	0
Clark, Walter B.	0	10	6
Cleaver, Samuel	0	5	0
Cooper, Henry	0	5	0
Cox, S. G.	0	10	6
Ellis, George	0	5	0
Esam, Richard	0	5	0
Garrett, John	0	5	0
Harvey, William R.	0	10	6
Lloyd, T. H.	1	1	0
Pechey, Thomas P.	0	5	0
Pickering, Henry	0	5	0
Sharp, Edward K.	0	5	0
Wand, Stephen	0	10	6
West, J. L.	1	1	0
Wilby, Frederick W.	0	10	6
Woolley, G. J. B.	0	5	0
Leigh.			
Bennett, John W.	0	5	0
Leighton Buzzard.			
Herington, Joseph	1	1	0
Leith.			
Alexander, W. G.	0	5	0
Black, George	0	5	0
Cairns, T. B.	0	5	0
Crichton, Alexander	0	10	0
Bowman, J.	0	10	0
Dow, William	0	2	6
Duncan, Flockhart, Powell and Co.	0	10	6
Finlayson, Thomas	0	5	0
Gutherie, Andrew D.	0	2	6
Mair, Alexander	0	2	6
Smith, Wilson and Sutherland	0	10	6
Lenton.			
Wilson, Thomas	0	5	0
Leominster.			
Davis, David F.	1	1	0
Ellwood, M. J.	0	5	0
Lerwick.			
Porteous, Arthur A.	0	2	6
Leven.			
Gibson, Adam	0	10	6
Lewes.			
Briscoe, Charles (West Firle)	0	5	0
Head, John	0	10	6
Head, John T.	0	10	6
Martin, Thomas	0	10	6
Leyland.			
Hackforth, Frederick	0	10	6
Lincoln.			
Battle, Son and Maltby	0	10	6
Tomlinson, Charles K.	1	1	0
Woodcock, Page D.	0	5	0
Liskeard.			
Young, Richard	0	5	0
Little Chishill.			
Jefferson, Thomas	0	10	6
Littlehampton.			
Longman, J. H.	0	2	6
Smart, C. F.	1	1	0
Little Sutton.			
Sherlock, John	0	5	0
Liverpool.			
Abraham, Alfred Clay	1	1	0
Abraham, Thomas Fell	1	1	0
Adams, Thomas E.	0	10	6
Adams, T. E., jun.	0	5	0
Albright, Henry	0	10	6
Alexander, George	0	5	0
Alexander, John	0	10	6
Ashbourne, C.	0	5	0
Ayrton and Saunders	0	10	6
Bathgate, William Lorimer	0	10	6
Bell, W.	0	5	0
Billington, Frederic	0	5	0
Blabey, J. J. (Woolton)	0	10	6
Blackbourne, H. J.	0	5	0
Blood, Charles (Formby)	0	5	0
Blundell, John	0	10	0
Bond, Henry	0	2	6
Bowman, William	0	10	6
Brown, Edwin	0	2	6

Liverpool—continued.	£	s.	d.
Brown, Joseph	0	2	6
Buck, J. M.	0	10	6
Buck, Richard C.	0	5	0
Budden, Frederick	0	2	6
Caley, J. C.	0	5	0
Chemists' Association	2	2	0
Clark, F.	0	5	0
Clarke, R. T.	0	5	0
Clay, Dod and Case	1	1	0
Collins, E. de Tedney	0	5	0
Coupland, Henry	0	10	6
Dale, John	0	10	6
Dickins, B.	0	5	0
Drawbridge, Joseph G.	0	10	6
Drawbridge, T. F.	0	5	0
Drew, S.	0	5	0
Edisbury, John	0	10	0
Edwards, E. W.	0	2	6
Ellams, George	0	10	0
Elliott, Robert John	0	10	6
Evans, Sons and Co.	5	5	0
Fergusson and Co.	1	1	0
Field, C.	0	10	6
Fingland, James	0	10	0
Fleming, Mrs.	0	5	0
Flint, John	0	10	6
Furniss, Thomas	0	5	0
Gabites, W.	0	5	0
Galloway, James B.	0	5	0
Girvan, John	0	5	0
Greenall, Alfred	1	1	0
Greig, James	0	5	0
Hackett, Thomas	0	10	0
Hannaford, William	0	5	0
Harris, F. G.	0	10	6
Hay, Thomas	0	10	6
Hocken, Joshua	0	10	6
Hodges, E. G.	0	5	0
Huggett, Sydney	0	10	0
Hughes, Michael	0	5	0
Hughes, Thomas I. J.	0	5	0
Hunt, Thomas	0	10	6
Jackson, F.	0	2	6
Jackson, H.	0	10	6
James, John	0	5	0
Jones, Frank	0	2	6
Jones. R. H.	0	5	0
Jones, William	0	5	0
Kirk, W. P.	0	5	0
Lee, Samuel	1	1	0
Lett, Arthur J.	0	5	0
Macdonald, John	0	2	6
Machin, Frederick J.	0	10	6
McGuffie and Co.	1	1	0
Manduell, Thomas	0	2	6
Maries, D. R.	0	5	0
Maskery, Samuel	1	1	0
Midgley, John E.	0	2	6
Parkinson, Richard	0	10	6
Parry, William	0	5	0
Pheysey, Richard	0	10	6
Richardson, Richard T.	0	10	6
Ridgway, T. E.	0	5	0
Rodgerson and Co.	0	2	6
Sawden, Alfred	0	10	6
Shaw, John	0	10	6
Sleggs, G. R.	0	5	0
Smith, J. J. (Walton-on-the-Hill)	0	5	0
Smith, R. G.	0	5	0
Sumner, Robert, and Co.	1	1	0
Symes, Charles	3	3	0
Taylor, Charles	0	10	0
Taylor, George	0	10	6
Thomas, Robert	1	1	0
Thompson and Capper	1	1	0
Thompson and Co.	1	1	0
Thompson, John	0	5	0
Troughton, Christopher	0	5	0
Williams, William	0	5	0
Williams, William	0	2	6
Woodhead, H. C.	0	10	0
Wright, William	0	10	6
Wyatt, H.	0	5	0
Wyatt, H., jun.	0	5	0
Llandilo.			
Williams, W. J.	0	2	6
Llandudno.			
Penney, W. S.	0	10	6
Llanelly.			
Evans, G.	1	1	0
Llanfyllin.			
Williams, William	0	10	6

Llangollen.	£	s.	d.
Jones, Humphrey	0	5	0
Llanrwst.			
Jones, Owen	0	2	6
Lockwood.			
Lister, C. E.	0		0
Loddon.			
Ellis, T. W.	0	10	6
London.			
Allden, John	0	10	6
Allen, Charles B.	1	1	0
Allwright, Isaac B.	0	10	6
Andrews, Frederick	0	10	6
Applegate, Edwin	0	10	6
Arkinstall, William	1	1	0
Armstrong, Richard	0	10	6
Atkinson, James	0	2	6
Atkinson, John G.	0	5	0
Attwood, Alfred	1	1	0
Attwood, Henry E.	1	1	0
Austin, Henry Felix	1	1	0
Babb, James	0	5	0
Baines, James C.	0	10	6
Baker, Alfred P.	0	10	6
Ball, The Chemists' (Committee of), per J. F. Savory.	21	0	0
Ball, The Junior Pharmacy, per W. H. Kerr	21	0	0
Barber, Joseph	0	10	6
Barnard, John	1	1	0
Barnes, James Benjamin	1	1	0
Barret, Edward Louis	1	1	0
Barron, Frederick	5	5	0
Bartlett, G. F. H.	0	5	0
Bartley, George A.	0	10	6
Barton, William H.	0	10	6
Bascombe, Frederick	0	5	0
Bate, Henry	0	10	6
Baxter, William	1	1	0
Beasley, Frederick	0	5	0
Beddard, John	1	1	0
Bedford, C.	0	10	6
Beere, L. E.	0	5	0
Bell, Matthew W.	1	1	0
Bell, William H.	1	1	0
Bennett, George	0	5	0
Bennett, Thomas	0	5	0
Bently, William Jas.	0	10	6
Best, James	0	10	6
Bettinson, W. T.	0	5	0
Betty, R. B.	0	2	6
Bevan, William	0	5	0
Bigg, Thomas	1	1	0
Bindloss, G. F.	0	5	0
Bingley, Richard	0	10	6
Birch, Henry C.	1	1	0
Bird, Augustus	2	2	0
Bird, Matthew M.	0	5	0
Bird and Storey	1	1	0
Bird, Robert	0	10	6
Bishop, Henry	0	2	6
Blake, Charles A.	0	10	6
Bland, John	0	10	6
Blyth, Utton	0	5	0
Boothby, H. N.	0	5	0
Bourdas, Isaiah	1	1	0
Bowen, John W.	0	5	0
Bradshaw, C. H.	0	10	6
Brand and Co.	1	1	0
Branford, A. J.	0	2	6
Bray, William	0	10	6
Bridges, C. W.	0	5	0
Bright, Frederick	0	5	0
Brisley, George	0	5	0
Brodribb, J. B.	0	10	0
Brookes, Samuel	0	10	6
Brown, Alfred James	0	10	6
Brown, H. F.	0	10	6
Buckle, Christopher Francis	0	10	6
Bullock, J. Lloyd and Co.	2	2	0
Bunker, James	0	2	6
Burgess, Willows and Francis	1	1	0
Burgoyne, Burbidges, Cyriax and Farries	2	2	0
Burn, Henry	0	5	0
Burton, Joseph	0	5	0
Bush, Arthur	0	5	0
Butler, Charles	0	10	6
Butler, E. D. Barry	0	10	6
Butt, Edward Northway	5	5	0
Butterfield, E.	0	10	6
Butterworth, John	0	5	0
Cadman, Daniel C.	1	1	0
Campbell, E. K.	0	3	0

London—continued.	£	s.	d.
Cannon, Charles	1	1	0
Carteighe, Michael	1	1	0
Cartwright, William B.	0	10	6
Caseley, Thomas	0	5	0
Catterns, Heneage P.	0	10	6
Cawdell, George	0	10	6
Chapman, Joseph J.	0	5	0
Chapman, Walter	0	10	6
Charity, William	0	10	6
Cheetham, W. H.	0	10	6
Churchill, J. and A.	1	1	0
Clapp, Edward F.	0	10	6
Clark, John A.	1	1	0
Clarke, Isabella Skinner	0	10	6
Cleaver, E. L.	0	10	6
Clift and Crow	1	1	0
Cocker and Son	0	10	6
Colchester, William M.	0	5	0
Colchester, William M., jun.	0	5	0
Coldwell, David B.	0	10	6
Cole, A. C.	1	1	0
Coleman, John	0	5	0
Coles, Ferdinand	0	10	6
Coles, J. W.	0	10	6
Collett, Charles B.	0	5	0
Collier, Henry	0	5	0
Constance, Edward	0	10	6
Constance, Herbert E.	0	10	6
Constance, Sidney W.	0	10	6
Cooper, Albert	1	1	0
Cooper, Henry	0	10	6
Cooper, Wm. Henry	0	10	0
Cooper, William Temple	0	10	6
Corbyn, Stacey and Co.	1	1	0
Cornelius, James	0	10	6
Cory, J. T. H.	0	10	6
Cosway, Edwin C.	0	10	6
Cottrill, John W.	0	10	6
Couper, F.	0	10	6
Cracknell, Herbert	0	5	0
Cranwell, W. B.	1	1	0
Crosby, James	0	10	6
Cross, Henry	0	2	6
Croyden, Charles	0	10	6
Cull, Joseph	0	10	6
Curtis, Fred. G.	0	5	0
Dadson, Horace C.	0	5	0
Dampney, Richard S.	0	10	6
Darby and Gosden	2	2	0
Darnill, Charles	0	5	0
Davenport, Horace	1	1	0
Davenport, J. T.	2	2	0
Davies, John	0	5	0
Davies, Llewelyn	0	2	6
Davies, Robert H.	1	1	0
Davis, H. S. E.	0	10	6
Davy, Yates and Routledge	2	2	0
Day, Thomas Sweeting	0	10	6
Dean, S.	0	5	0
Deane (Henry) and Co.	1	1	0
De Peare, John Thomas	0	5	0
Dewar, Mary Ann	0	10	6
Dinneford and Co.	2	2	0
Dodman, Robert	0	2	6
Dodridge, Thos. M.	0	2	6
Doulton and Co.	1	1	0
Drane, William	0	10	6
Drew, Henry Wm.	0	5	0
Drury, Sydney	0	5	0
Dyer, E. H.	0	5	0
Dymott, Frank	0	5	0
Dyson, William B.	1	1	0
Eade, George	1	1	0
Eade, James	1	1	0
Eastman, J. E.	0	10	6
Edwards, Charles	0	10	6
Edwards, William Staples	0	5	0
Elliott, J. D.	0	10	6
Elvey, Thomas	1	1	0
Emslie, Joseph	0	5	0
Epps, James	1	1	0
Evans, Lescher and Webb	1	1	0
Eve, Charles	1	1	0
Evershed, G. S.	0	5	0
Eyre, Jonathan S.	0	10	6
Fallowfield, Jonathan	1	1	0
Farmer, John	0	5	0
Ferguson, W. H.	1	1	0
Fitch, Robert Owen	0	10	6
Fitt, Francis E.	0	10	6
Ford, Charles	0	5	0
Forrest, Richard	1	1	0
Fox, William	1	1	0
Francis, G. Bult	1	1	0
Francis, George Baggett	1	1	0
Francis, Matthew R.	0	10	6
Francis, W. H.	0	10	6

London—continued.	£	s.	d.
Froom, William Henry	1	1	0
Frost, W. T.	0	10	6
Fryer, Arthur	0	5	0
Gadd, Charles	0	10	6
Gadd, Robert	0	10	6
Gale, Samuel	1	1	0
Garman, E. C.	0	5	0
Garner, James	0	10	6
Garner, Thomas	0	5	0
Garnham, A. W.	0	5	0
Gaunt, Rann Dolphin H.	1	1	0
Gedge, William S.	0	10	6
Gerrard, A. W.	0	10	6
Glasspoole, H. G.	0	10	6
Godfrey, H. E.	0	5	0
Goff, Richard	0	5	0
Golding, John F.	1	1	0
Goodall, William A.	0	5	0
Goodchild, Alfred C.	0	5	0
Goodger, David	0	10	6
Goodwin, John	1	1	0
Gorton and Sons	0	10	6
Gossling, William R.	0	5	0
Gower, A. J.	0	5	0
Granger, Edwin John	1	1	0
Green, Samuel	0	5	0
Green, W J.	0	10	6
Greenish, T. Edward	0	10	6
Greenish, Thomas	1	1	0
Griffiths, Alfred William	0	10	6
Gristock, Thomas	1	1	0
Groves, H. F.	2	2	0
Gudgeon, Frederick G.	0	2	6
Gulliver, William	0	10	6
Gulliver, Wm. Inchle	0	5	0
Hadfield, Henry M.	0	5	0
Hairsine, H. S.	1	1	0
Hall, Ralph	0	10	6
Hampson, Robert	1	1	0
Hanbury, Cornelius	1	1	0
Hannah, Charles	0	10	6
Hardy, Samuel C.	1	1	0
Harris, Daniel R.	0	10	0
Harris, Frank William	0	5	0
Harris, Robert	0	10	6
Harrison and Horne	0	10	6
Hart, Thomas	0	2	6
Harvey, Edward	1	1	0
Harvey, John William	0	2	6
Harvey, William	0	5	0
Harwood, Charles	0	10	6
Hatfield, George B.	0	10	6
Hatfield, George W.	0	5	0
Hawkins, Thomas	1	1	0
Hayhoe, W.	0	5	0
Hayward, Charles	0	10	6
Hearn, John	0	5	0
Heath, Frederick D.	0	5	0
Heathcoat, Thomas	0	10	6
Henty, Henry Martin	0	5	0
Herbert, William	0	5	0
Hick, John	0	5	0
Hickey, Evan Lewis	0	10	6
Hickman, William	0	10	6
Higgins, James	0	10	6
Hill, Arthur B.	1	1	0
Hill, Arthur S.	2	2	0
Hill, William	0	5	0
Hills, Henry William	0	10	0
Hills, Thomas Hyde	10	10	0
Hills, Walter	1	1	0
Hobbs, John K.	0	5	0
Hodgkinson, George A.	0	10	6
Hodgkinson, Stead and Treacher	2	2	0
Hodgkinson (Thomas), Prestons and King	2	2	0
Hodgkinson, William	1	1	0
Hodgson, Alfred	0	5	0
Hodsoll, Thomas W. H.	1	1	0
Hogg, E. G.	0	10	6
Hogg, Robert	0	10	6
Holford, T. Constantine	0	10	0
Holl, Edmund	0	5	0
Holmes, A. J.	0	5	0
Holmes, C. J.	1	1	0
Holmes, Walter M.	0	10	6
Hooper, Leonard	1	1	0
Hopkin, William King	2	2	0
Hora, Henry Whinfield	1	1	0
Hora, W. T.	0	5	0
Horncastle, John	1	1	0
Howard, George	1	1	0
Howard, J. H. H.	1	1	0
Howe, J. M. W.	0	2	6
Howell, Maurice	0	10	6
Howlett, Samuel	1	1	0
Hucklebridge, J. M.	1	1	0

London—continued.	£	s.	d.
Hudson, T. F.	0	5	0
Huggins, Richard	0	10	6
Hughes, Evan	0	10	0
Hugill, John	1	1	0
Hugill, John H.	1	1	0
Hunt, Charles	1	1	0
Hurley, Edward W.	0	5	0
Huskisson, Henry Owen	1	1	0
Hussey, Robert	0	5	0
Hyslop, John Cahill	1	0	0
Icke, Henry S.	0	10	6
Idris and Co.	2	2	0
Ingham, John	0	5	0
Ingram and Royle	1	1	0
Ive, William	1	1	0
Izod and Son	1	1	0
Jacka, Vivian T.	0	10	6
Jacks, D. R.	0	5	0
Jackson, C.	0	10	6
Jackson, William F.	1	1	0
Jackson, William H.	0	5	0
Jagg, J. Henry	0	10	6
Jameson, W. G., junr.	1	1	0
Jarvis, John S.	0	10	6
Jarvis, Thomas	0	10	6
Jeffcoat, Joseph	1	1	0
Jenkins, Henry	1	1	0
Jewell, J. R.	0	5	0
Johnson and Sons	1	1	0
Jones, Edwin	0	5	0
Jones, Henry Stevens	0	5	0
Jones, John H.	0	10	6
Jones, Thomas	0	5	0
Jones, W. Cadwaladr	1	1	0
Jones, W. H.	0	2	6
Jones, William	0	10	6
Jones, William	0	5	0
Jones, William E.	0	2	6
Jones, William John	0	10	6
Jones, William N.	0	2	6
Jones, William O.	0	10	6
Jozeau, G.	1	1	0
Keer, Thomas H.	0	10	6
Kemp, Robert	0	10	6
Kent, James S.	0	10	6
Kent, Thomas	0	10	6
Kent, Thomas Ramsey	0	10	6
King, Henry	0	10	0
King, William	0	5	0
Kingsford, Frederick	1	1	0
Kinross, W. M.	0	6	0
Kirk, Snowden	0	10	6
Kitson, Samuel	0	2	6
Laing, John S.	0	5	0
Lance, W. N. G.	0	10	6
Large, John H.	0	10	6
Lavers and Son	1	1	0
Lawrence, Frederick	0	10	6
Laws, John	0	10	6
Lawson, Arthur	0	5	0
Leath and Ross	2	2	0
Leech, Elizabeth	0	10	6
Legg, H. A.	0	10	6
Lescher, Joseph S.	1	1	0
Lewinton, Alexander B.	1	1	0
Lewis, Thomas	0	5	0
Leyland, Thomas W.	0	2	6
Little, John A.	0	5	0
Lloyd, Thomas	0	10	6
Long, Henry	1	1	0
Longley, Charles	0	5	0
Lovegrove, G. E.	0	5	0
Lowe, William E.	2	2	0
Luff, Richard	0	10	6
Lugar, Henry	0	5	0
McDougall, James	0	2	6
MacGeorge, William	0	10	6
Madeley, E. S.	0	10	6
Maizey, E.	0	10	6
Marks (Henry) and Sons	1	1	0
Marsh, E. R.	0	10	6
Marston, John Thomas	0	10	6
Marten, Frederic	0	5	0
Martindale, William	1	1	0
Mathews, Henry	0	10	6
Mathews, J. H.	0	10	6
Matthews, Edward	0	10	0
Matthews, J. H.	0	5	0
Matthews, Thomas	0	5	0
Maw, C. Trentham	1	1	0
Maw, Charles	1	1	0
Maw, Son and Thompson	2	2	0
Mead, Charles J.	1	1	0
Meggeson and Co.	1	1	0
Mellin, Charles J.	0	5	0
Mennell, Z.	0	10	6
Merrell, James	1	1	0

London—continued.	£	s.	d.
Middleton, Francis	1	1	0
Millhouse, H. H.	0	5	0
Miller, Cecil B.	0	5	0
Miller, Charles Bayfield	0	15	6
Miller, W. E.	0	5	0
Mills, W. D.	0	2	6
Milward, S.	0	10	6
Minshull, Flora	0	5	0
Minshull, Rose C.	1	1	0
Moore, John	0	5	0
Morrell, F. K.	0	5	0
Morrell, Thomas	0	5	0
Morris, Thomas	1	1	0
Mortiboy, John	1	1	0
Morton, Henry	0	2	6
Mutch, John Pratt	0	5	0
Muter, Dr. John	3	3	0
Naylor, W. A. H.	0	5	0
New, Walter W.	0	10	6
Newey, J. T.	0	10	6
Newton, T. A. C.	0	5	0
Newzam, Henry Samuel	0	10	6
Nicholls, Joseph C.	0	5	0
Nicholson, Thomas T.	0	5	0
Nicholson, W. O.	1	1	0
Nind, George	0	10	0
Nobbs, W. N.	0	10	6
Norburn, A. H.	0	5	0
North, George T.	0	10	6
Notcutt, W. B.	0	5	0
Orpe, Thomas M.	0	10	6
Padman, Thomas	0	10	6
Palmer, Francis	0	10	6
Palmer, Robert	1	1	0
Paramore, Dr. R.	0	5	0
Parker, J. W.	0	5	0
Parker, Robert Henry	0	10	6
Parkes, J. C.	0	10	6
Parkes, J. P.	1	1	0
Parkinson, Charles	0	10	6
Parkinson and Son	1	1	0
Parrott, Joseph	0	10	6
Parry, C. D.	0	5	0
Parsons, G. H.	2	2	0
Pasmore, F. R.	0	10	6
Passingham, G. W.	0	10	6
Pattison, George	1	1	0
Peacock, George	0	5	0
Peck, Edward	0	5	0
Peel, Alfred	0	10	6
Penrose and Son	1	1	0
Pepper, John	0	10	6
Pharmacy Club (per Richard Bremridge, Hon. Sec.)	10	10	0
Phillips, A. J.	0	5	0
Phillips, A. W.	0	2	6
Phillips, W. T.	0	5	0
Pickard, William	2	2	0
Pidduck, J. W.	0	10	6
Pike, William	0	10	6
Pinyon, William	0	5	0
Pipe, Walter	0	10	6
Place, John N.	0	10	6
Plaister, W. J.	0	10	6
Plowman, Sidney	1	1	0
Poingdestre, C. R.	0	10	6
Pond, B. C.	0	5	0
Pond, George P.	1	1	0
Potts, Robert A.	1	1	0
Powell and Sons	1	1	0
Powell, T. H.	1	1	0
Prebble, John G.	0	5	0
Preston, Richard	0	10	6
Pretty, Charles	0	5	0
Price, Robert John	0	2	6
Prichard, Edward	1	1	0
Prime, Thomas R.	0	10	6
Radermacher, C. J.	0	10	6
Rawlinson, Ralph	1	1	0
Read, John Henry	0	5	0
Reece, Thomas	0	5	0
Reed, Charles W.	0	10	6
Rees, Harding	0	10	6
Richardson, James	0	5	0
Richardson, John	0	5	0
Ricketts, James	0	5	0
Ridding, William	0	10	6
Rigg, G. F.	0	5	0
Roach, H. W.	1	1	0
Roach, Pope	1	1	0
Robinson, Charles J.	0	10	6
Robinson, H. S.	0	5	0
Robinson, R. A.	0	10	6
Robinson, William P.	0	10	6
Rogers, James	0	10	0
Rose, Alfred	1	1	0
Rowden, Lewis	0	5	0
Rowe, Robert	1	1	0
Rowntree, Thomas	0	10	6
Rowson, Henry	1	1	0
Rutter, Edmund Yates	1	1	0
Rutter, John	0	5	0
Sadgrove, A. A.	0	5	0
Sadler, William	0	10	6
Sadler, William, jun.	0	5	0
Sandford, Geo. W.	2	2	0
Sandy, Frederick William	0	10	6
Sangster, Arthur	1	1	0
Saunders, C.	0	10	6
Saunders, Thos. S.	1	1	0
Schacht, William	0	10	6
Scoley, Thomas E.	0	5	0
Sedcole, J. W.	0	10	6
Sell, W. H.	0	10	6
Selleck, Edward	0	10	6
Shapcott, W. H. P.	0	2	6
Sharman, Wm.	0	5	0
Shephard, Thomas F.	0	10	6
Shepley, Frederick Thos.	0	5	0
Sherwood, N.	0	5	0
Shields, R. H.	0	5	0
Shirley, J. G.	2	2	0
Shirley, S. S.	0	10	6
Shone, Owen E.	0	2	6
Silverlock, Henry	5	5	0
Silvers, Francis T.	0	10	6
Sims, C. R. H.	0	5	0
Skinner, A. J. P.	0	5	0
Skinner, Robert	0	5	0
Slipper, James	0	10	6
Smart, John	0	10	6
Smart, W.	0	10	6
Smith, C. B.	0	5	0
Smith, Harry J.	0	2	6
Smith, John Ord	0	10	6
Smith, Percy John	1	1	0
Smith, William	0	10	6
Smith, William Frederick	1	1	0
Smith, William L.	0	10	6
Spyer, Newton	0	10	6
Squire, P. and P. W.	5	5	0
Stableforth, J. W.	0	5	0
Stacy, Frederick	0	5	0
Stacy, Samuel Lloyd	1	1	0
Stammwitz, Louisa	1	1	0
Stamp, Edward B.	0	10	6
Stansfield, Richard	0	5	0
Starkie, Richard S.	1	1	0
Steer, Philip R.	0	10	0
Stenson, Joseph	0	5	0
Stephens, Henry I.	0	5	0
Stevens, Felix	0	5	0
Stevens, Peter Augustus	0	10	6
Stickland, W. H.	1	1	0
Stiling, John E.	0	10	6
Stoneham, Philip	0	10	6
Strickett, John	0	10	6
Strongitharm, W. G.	0	5	0
Summers, James R.	0	10	6
Swan, M. E.	0	5	0
Swift, Francis	0	10	6
Symons, William H.	1	1	0
Taplin, William Gilbert	1	1	0
Taubman, Robert	0	10	6
Taylor, George S.	1	1	0
Taylor, Horatio	0	10	6
Taylor, John	0	10	6
Taylor, Matthew	0	10	6
Taylor, Peter	0	5	0
Tebbutt, Edwin	0	10	0
Tench, Richard	1	1	0
Thomas Harry A.	1	1	0
Thomas, Henry	1	1	0
Thompson, Arthur S.	0	5	0
Thompson, C.	0	10	6
Thompson, Henry	0	10	6
Thompson, Henry Ayscough	1	1	0
Thompson, John	1	1	0
Thorn, John James	1	1	0
Tijou, Tom	0	5	0
Tingle, Ellen	0	5	0
Tomlinson, Thomas	1	1	0
Trask, Thomas	1	1	0
Tregear, A. F.	0	5	0
Trick, William B.	0	5	0
Troke, Charles	0	10	6
Tugwell, William H.	0	10	6
Turner, Charles E.	0	10	6
Turner, Edward A.	1	1	0
Tyrer, Peter	0	10	6
Van, Frederick W. S.	0	5	0
Vialls, J. B.	1	1	0
Vincent and Son	1	1	0
Voelcker, Augustus	1	1	0
Walker, Byatt A.	0	5	0
Walker, Charles	0	5	0
Wallis, George	0	5	0
Wallis, John T. W.	0	10	6
Wallis, Owen	0	10	6
Ward, Francis	1	1	0
Waring, A. W.	0	5	0
Warren, Francis W.	0	5	0
Warren, William	0	10	6
Wastie, Francis	0	5	0
Watson, William	0	10	6
Watts, Alfred	0	5	0
Weatherley, Richard J.	0	5	0
Webb, E. A.	1	1	0
Wells, Thomas	0	5	0
Weston, Samuel John	1	1	0
Westrup, Joseph B.	0	10	6
Whiffen, Thomas	5	5	0
Whigham, Robert L.	0	5	0
White, Charles	1	1	0
White, Charles E.	0	5	0
White, W. T.	1	1	0
Whittle, Elias C. C.	0	5	0
Wickham, W.	0	10	6
Wigg, Henry J.	1	1	0
Wiggins, Henry	0	10	6
Wilkes, Henry	0	5	0
Wilkinson, Benjamin John	0	5	0
Wilkinson, Robert	0	10	6
Wilkinson, Thomas	1	1	0
Will, William W.	0	5	0
Willats, Richard	0	5	0
Williams, Hugh	0	5	0
Williams, James	0	10	6
Williams, James	0	5	0
Williams, John	2	2	0
Williams, Joseph J.	0	5	0
Williams, J. W.	1	1	0
Wills and Wootton	1	11	6
Wilson, John C.	0	5	0
Winter, William	0	10	6
Wisken, Robert	0	5	0
Wodderspoon and Co.	1	1	0
Woodland, John	0	10	6
Woolldridge, John	0	10	6
Woollings, Frank	0	2	6
Wooster, J. R.	2	2	0
Wootton, Alfred C.	2	2	0
Wright, Layman and Umney	2	2	0
Wyatt, Francis J.	0	10	6
Wylde, George	0	10	6
Yates, Samuel P.	0	5	0
Young George	0	5	0
Long Bennington.			
Bemrose, John	0	10	6
Long Sutton.			
Winfrey, Richard	0	5	0
Longton.			
Hemming, George Thomas	0	5	0
Litchfield, John	0	10	6
Prince, Arthur G.	0	10	0
Sibary, George	0	10	6
Turner, Thomas	0	5	0
Looe.			
Poad, John	0	5	0
Loughborough.			
Handley, Thomas	0	10	6
Paget, John	0	5	0
Louth.			
Dennis, J. W.	0	5	0
Lowestoft.			
Chaston, Anna Maria	0	10	6
Good, Thomas	0	10	6
Moverley, Robert	0	10	6
Sale, Thomas John	0	5	0
Stebbing, W.	0	5	0
Wright, Arthur	0	5	0
Ludlow.			
Bessell, J. W.	0	5	0
Cocking, George	0	5	0
Marston, Alfred	0	5	0
Nickson, James	0	5	0
Smith, F. W.	0	2	6
Woodhouse, George	0	5	0
Luton.			
Hall, Ephraim	0	5	0
Lutterworth.			
Brown, Thomas	0	10	6

Lyme Regis.	£	s.	d.
Henley, George	0	5	0
Lymington.			
Allen, Adam U.	0	5	0
Badcock, Henry	0	10	0
Lymm.			
Evans, Isaac H.	0	5	0
Henshall, James	0	5	0
Lytham.			
Hartley, John	0	5	0
March, Richard	0	5	0
Macclesfield.			
Bates, William I.	0	10	6
Bower, John	0	5	0
Cooper, Thomas	0	5	0
Duncalf, Thomas H.	0	10	6
Thomas, Richard	0	10	6
Wood, Richard	0	10	6
Macduff.			
Henry, J. Hay	0	5	0
Machynlleth.			
Rees, Edward	0	5	0
Maidenhead.			
Walker and Son	1	0	0
Walton, Ralph	0	10	6
Maidstone.			
Corfe, Alfred	0	5	0
Evans, D. C.	0	2	6
Jennings, Francis R.	0	5	0
Ridley, Charles H.	0	5	0
Rowcroft, Albert E.	0	5	0
Stonham, Thos. G.	0	10	6
Wells, W. George	0	2	6
Maldon (Essex).			
Crick, George E.	0	10	6
Wallworth, David	0	10	6
Malmesbury.			
Brown and Ratcliffe	1	1	0
Malton (Yorks).			
Buckle, James	0	5	0
Hardy, George	0	5	0
Laverack, W. H.	0	5	0
Longbotham, Mrs. M.	0	5	0
Malvern Wells.			
Clark, Edward J.	0	5	0
Wakefield, Cecil H.	1	1	0
Manchester.			
Ashford, R.	0	5	0
Balmforth, A.	1	1	0
Baron, Richard E.	0	2	6
Bates, Frederic W.	0	5	0
Benger, F. Baden	1	1	0
Bew, John	1	1	0
Biggin, Samuel	0	5	0
Blyton, John	0	10	6
Bond, W.	0	5	0
Boor, Frederick	0	10	6
Booth, William G.	0	10	6
Brooks, Joseph	1	0	0
Brown, William Scott	1	1	0
Bushby, Thomas	0	5	0
Carter, William	0	10	6
Casey, Edward	0	2	6
Darling, William	1	1	0
Dawson, Robert	0	5	0
Edwards, George	0	5	0
Elborne, William	0	5	0
Eyre, J. J.	0	5	0
Gibbons, Thomas G.	1	1	0
Gibbons, Walter	0	10	6
Gibson, Joshua	0	5	0
Gibson, Robert	1	1	0
Hall, Stacey	0	5	0
Hardeman, John	0	10	6
Hart, James	1	1	0
Holt, John	0	2	6
Hughes, Evan G.	0	10	6
Hunt, L.	1	1	0
Jackson, A. H.	0	10	6
Jackson, George	0	10	6
Jackson, Thomas	0	10	6
Jones, Joseph	0	5	0
Jones, J.	0	5	0
Jones, P. V.	0	2	6
Kellett, Henry (Salford)	1	1	0
Kemp, Harry	0	5	0
Lambert, Thomas (Bradford)	0	5	0
Lane, William	0	5	0
Lowe, Walter	0	10	6
McCormick, F. H.	0	5	0
Marsden, Thomas B. (Withington)	0	5	0
Marshall, H. W.	0	5	0
Massey, John	0	5	0
Maunder, Robert	0	10	6
Methuen, Richard	0	10	6
Midgley, Charles	0	10	6
Mitchell, John	0	5	0
Moir, David	0	5	0
Morris, J. L.	0	5	0
Mumbray, H. G.	0	5	0
Mundey, H.	0	5	0
Newbould, T. A.	0	10	6
Nuttall, R. H.	0	15	6
Oakley, Joseph	0	5	0
Oldfield, Pattinson and Co.	1	1	0
Osborne, T. C. E.	0	5	0
Paine, Standen	1	1	0
Pickup, Robert L.	1	1	0
Pidd, Arthur J.	0	10	6
Ransome, Thomas	1	1	0
Roberts, John	0	10	6
Rowland, E. E.	0	5	0
Royle, John	0	5	0
Saunderson, George C.	0	10	0
Scaife, Samuel	0	10	6
Slack, John L.	0	5	0
Standring, Son and Co.	1	1	0
Stones, William	1	1	0
Sutcliffe, C. H.	0	5	0
Sutherland, Joseph	0	10	0
Swinn, Charles	0	10	6
Sylvester, Paul	0	5	0
Terry, Thomas (Withington)	0	5	0
Thornley, C.	0	10	6
Tomkins, Dr. Henry	0	5	0
Tompsett, Leighton S.	0	5	0
Turner, W. S.	0	2	6
Twemlow, Richard	0	10	6
Walsh, Edward	0	10	6
Walton, H.	0	5	0
Wealthall, Alfred	0	10	0
West, Thomas	0	5	0
Westmacott, George H.	0	10	6
Wheeldon, James	0	5	0
Whittaker, Ellis (Salford)	0	10	6
Wilkinson, George	0	5	0
Wilkinson, William	1	1	0
Wood, George E.	0	5	0
Woolley, Sons and Co.	3	3	0
Wright and Barnaby	1	1	0
Yates, Ebenezer	0	5	0
Mansfield.			
Adams, Benjamin	1	1	0
Oldham, John	0	10	6
Patterson, Douglas J.	0	5	0
Margate.			
Baily, John	0	10	6
Cadby, Saml. K.	0	5	0
Candler, Joseph T.	0	10	6
Gale, Henry	0	10	6
Haffenden, James	0	5	0
Harvey, William S.	0	10	6
Wootton, Edward S.	0	10	6
Market Drayton.			
Cooke, William H.	0	5	0
King, William George	0	10	6
Market Harborough.			
Deacon, Fanny E. (Fleckney)	0	5	0
Markinch.			
Robertson, Andrew	0	2	6
Maryport.			
Cockton, John	0	5	0
Masham (Yorks).			
Barker, Mathew M.	1	1	0
Kendall, George	0	5	0
Matlock Bath.			
Platt, William	0	5	0
Mayfield.			
White, Edward A.	0	5	0
Mere (Wilts).			
Bracher, Edwin	0	7	6
Merton.			
Johnson, Joseph	0	10	6
Mexborough, New.			
Shields, Robert J.	0	10	6
Micheldean.			
James, Henry	0	5	0
Middlesborough.			
Buck, Thomas	0	5	0
Harrington, P. J.	0	5	0
Hume, William A.	0	5	0
Sowerby, Richard	0	5	0
Taylor, H. H.	0	5	0
Taylor, William R.	0	5	0
Midhurst.			
Cowap, Samuel E.	0	5	0
Millom.			
Roberts, John L.	0	2	6
Minchinhampton.			
Simpkins, John	0	10	6
Mintlaw (N.B.).			
Hardie, Alexander	0	5	0
Mirfield (Yorks).			
Crook, Charles	0	5	0
Monmouth.			
Key, Hobson	0	10	6
Montrose.			
Burrell, George	0	5	0
Davidson, A.	0	5	0
Morecambe.			
Birkett, John	0	5	0
Morpeth.			
Marshall, G. T.	0	5	0
Mussoorie (India).			
Samuel, James B. and Edward	1	1	0
Nailsworth.			
Mason, William W.	0	2	6
Nantwich.			
Manley, Henry (Aston)	0	2	6
Naples.			
Bateman, J. M.	0	19	6
Natal.			
Taylor, Edward	0	6	10
Neath.			
Hayman, Alfred	0	10	6
Hutchins, Charles	0	2	6
Needham Market.			
Harrington, Allen	0	10	6
Nelson.			
Collins, M. A.	0	5	0
Nether Stowey.			
Ham, John	1	1	0
Newark.			
Bennett, William	0	5	0
Bilson, F. E.	0	5	0
Cooling, W. J.	0	5	0
Foster, H. P.	0	5	0
Sneath, Thomas D.	0	5	0
New Barnet.			
Young, Robert Fisher	0	10	6
New Brighton.			
Rose, Charles	0	5	0
New Brompton (Kent).			
Willis, Henry J.	0	5	0
Newbury.			
Davis, Henry J.	0	5	0
Pratt, Thomas H.	0	5	0
Newcastle-on-Tyne.			
Bascombe, William	0	5	0
Bolan, John	0	10	6
Coates, John M.	0	10	6
Frater, G.	0	5	0
Gatward, Oswald	0	5	0
Hunter, Frederick W.	0	5	0
Ismay and Sons	0	10	6
Johnstone, W. B. (Byker)	0	5	0
Mann, Robert	0	10	6
Marley, William	0	10	6
Martin, N. H.	1	1	0
Mawson, R. O.	0	5	0
Owen, William	0	10	6
Payne, J. B.	0	5	0
Proctor, Barnard S.	1	1	0
Rheeder, T.	0	5	0

Newcastle-on-Tyne—continued.	£	s.	d.
Smith, G. F.	0	10	6
Stuart, Charles E.	0	10	6
Swan, Joseph W.	1	1	0
Watson, Mason	0	10	6
Weddell, George	0	5	0
Wilkinson, T. T.	0	5	0
Wray, E.	0	2	6
Wright, Alfred	0	10	6
Newcastle-under-Lyne.			
Cartwright, William	0	10	6
Heathcote, Thomas S.	0	10	6
New Malden.			
Stone, Thomas W.	0	5	0
Newmarket.			
Barrow, Frank A.	1	1	0
Newport (I. W.).			
Millidge, Alfred	0	5	0
Shepperd, William J.	0	2	6
Newport (Mon.).			
Faulkner, H.	0	5	0
Garrett, T. P.	0	5	0
Gratte, Henry J.	0	5	0
Morgan, Mrs.	0	2	6
Paine, Charles	0	10	6
Phillips, John	0	10	6
Phillips, J. W.	0	5	0
Price, George	0	5	0
Seys, James A.	0	5	0
Young, John	0	10	6
Newport (Salop).			
Picken, Thomas William	0	10	6
New Radford.			
Jenkins, John Thomas	0	5	0
Newthorpe.			
Robinson, Whiteley	0	5	0
Newton Abbot.			
Butland, Charles	0	5	0
Poulton, John	0	5	0
Price, John	0	2	6
Wright, W.	0	5	0
Newtown (Mont.).			
Morgan, Richard	0	10	6
New Whittington.			
Slater, Arthur	0	5	0
Nice (France).			
Jobson, Thomas	0	5	0
Woods, William H.	0	5	0
Norbiton.			
Greenwood, J.	0	10	0
Playford, F. W.	0	2	6
Northallerton.			
Fairburn, Joseph	0	10	6
Squince, John A.	0	5	0
Warrior, Henry	0	5	0
Warrior, William	0	10	6
Northampton.			
Ashford, Evan Charles	0	5	0
Barry, James	1	1	0
Berry, J. P.	0	5	0
Bingley, John	0	10	6
Gulliver, George E.	0	5	0
Harris, Jane L.	0	5	0
Kirby, Frederick	0	5	0
Mayger, William D.	1	11	6
Merrick, Thomas J.	0	10	0
Negus, Samuel	0	15	0
Osborne, George C.	0	5	0
Saul, W. B.	0	5	0
Sindall, J. W. (Executors of)	0	5	0
Woolston, Thomas H.	0	5	0
North Kelsey.			
Dixon, James	0	3	0
North Newbald.			
Everatt, Robert	0	2	6
North Walsham.			
Bailey, George Wm.	0	5	0
Northwich.			
Lee, William	0	5	0
Ramsey, Joseph	0	5	0
Norwich.			
Caley, Albert J.	0	10	6
Cooke, William	0	5	0
Corder, Octavius	1	1	0
Cossey, John	0	5	0
Cripps, Johnson (Hackforth)	0	5	0
Cubitt, Charles	0	10	0
Forster, A. W.	0	2	6
King, H. A.	0	5	0
Mallett, H. P.	0	5	0
Roberts, R.	1	1	0
Robinson, James	0	5	0
Sutton, Francis	0	10	6
Taylor, H. E.	0	5	0
Thompson, H.	0	2	6
Watson, J. E. H.	0	10	0
Nottingham.			
Beardsley, J.	0	5	0
Beverley, R. H.	0	5	0
Bolton, Charles Alfred	0	10	6
Chemists' Association	5	5	0
Dadley, Elijah	0	10	6
Dennis, John L.	0	10	6
Edgson, Hugh	0	10	6
Fitzhugh, Richard	1	1	0
Fletcher, Thomas	0	5	0
Flowerdew, W. C.	0	2	6
Holgate, S. V.	2	2	0
Jackson, Roberts	0	10	6
Lomas, Joseph	0	5	0
Lumby, Fred	0	5	0
Manfull, H. J.	0	5	0
Mason, Thomas	0	10	6
Parker, W. H.	0	5	0
Patchitt, Edwin C.	1	1	0
Pearson, Edward	1	1	0
Potts, R. S.	1	1	0
Rayson, J. T.	0	5	0
Smithurst, John	0	5	0
Taylor, Thomas C.	0	10	6
Warriner, C. W.	0	5	0
White, Frank	0	10	6
Whitworth, John	0	10	6
Wilford, J.	0	10	0
Nuneaton.			
Iliffe, George	0	5	0
Lester, Henry	0	5	0
Oakham.			
Wellington, James	0	10	6
Old Brompton.			
Stokes, Walter E.	0	10	0
Oldbury.			
Holmes, Joseph P.	0	5	0
Oldham.			
Bagshaw, William	0	10	6
Bates, H.	0	10	6
Berry, Thomas	0	5	0
Braddock, George	1	1	0
Brelsford, James	0	5	0
Glover, John S.	0	10	6
Goodall, Frederick	0	10	6
Hargraves, H. L.	0	10	6
Haslop, William	0	5	0
Lord, Robert B.	0	5	0
Potts, Walter	0	5	0
Olney (Bucks).			
Wright, Ann	0	5	0
Ormskirk.			
Garside, S. A.	1	1	0
Oswaldtwistle.			
Haworth, William	0	5	0
Oswestry.			
Evans, John	0	10	6
Roberts, William Carey	0	2	6
Smale, Mary E.	0	5	0
Smale, Richard B.	0	5	0
Vaughan, David	0	10	6
Otley (Yorks).			
Blade, E.	0	5	0
Pratt, Richard M.	0	10	6
Oundle.			
Turner, Robert	0	10	6
Over Darwen.			
Shorrock, R.	0	5	0
Oxford.	£	s.	d.
Bloxham, W. E.	0	5	0
Clayton, C.	0	2	6
Cousins, Thomas G.	0	5	0
Druce, George C.	0	5	0
Hill, James H.	0	5	0
Hitchcock and Son	1	1	0
Houghton, Thomas	0	10	6
Jenkins, Alexander	0	5	0
Luff, William	0	5	0
Modlen, Robert	0	5	0
Prior, George T.	0	10	6
Squire, James	0	5	0
Thurland, Henry	0	10	6
Walsh, Edward	0	10	6
Way, I. F.	0	5	0
Padiham.			
Brewster, Thomas	0	5	0
Webster, Paul	0	10	0
Paignton.			
Sherriff, George	0	5	0
Paisley.			
Cullen, Thomas	0	5	0
Partick (N.B.).			
Rait, Robert C.	0	10	6
Pau (France).			
Jarvis, John	1	1	0
Smith, Charles C.	0	5	0
Paulton (Somerset).			
Bush, Thomas	0	5	0
Pembroke Dock.			
Lane, William	0	5	0
Penarth.			
John, W. D.	0	5	0
Pendleton.			
Hume, Thomas	1	1	0
Robinson, Benjamin	0	10	0
Penrith.			
Kirkbride, William	0	5	0
Redfern, Tom	0	5	0
Pen-y-graig.			
Lloyd, Rees	0	5	0
Penzance.			
Buckett, A. H.	0	5	0
Perth.			
Blair, R. P.	0	5	0
Donald, David	0	7	6
Newby, W. H.	1	1	0
Peterborough.			
Bodger, J. W.	0	5	0
Bridges, G. A.	0	10	6
Bright, Richard	0	10	6
Carlton, Arthur	0	10	6
Heanley, Marshall	0	10	6
Knight, W. T.	0	5	0
Pearson, John H.	0	10	6
Sturton, J. R.	0	10	6
Turner, R. P.	0	2	6
Whitwell, Ewen	0	5	0
Willson, Stephen J.	0	10	6
Petherton.			
Wellington, Frederick G. N.	0	5	0
Petworth.			
Morgan, Frank G.	0	10	6
Pinner.			
Trist, Richard	0	5	0
Plymouth.			
Adams, W. T.	0	5	0
Allen, Joseph	0	10	6
Balkwill, A. P.	0	10	6
Barge, John	0	5	0
Bennett, R. M.	1	1	0
Burdwood, James	0	5	0
Goodwin, Medmer	0	10	6
Hearder, H. P.	0	10	6
Hetherington, J. H.	0	5	0
Hill, Richard C.	1	1	0
James, John B.	0	10	6
Luke, R. S.	0	5	0
Maitland and Son	0	5	0
Marsh, John	0	5	0
Maurice, James	0	10	6
Roper, R. F.	0	5	0
Saunders, R. A.	0	10	6
Sloggett, Thomas C.	0	5	0
Turney, Samuel B.	0	5	0
Woods, William	0	10	6

Pontardulais.	£	s.	d.
Bowen, Ebenezer	0	10	

Pontefract.			
Bratley, William	0	5	0

Pontypool.			
Ford, Edward B.	0	10	6

Pontypridd.			
Key, W. H.	1	1	0

Poole.			
Atkins, T. W.	0	2	6
Hamilton, Julius	0	5	0
Penny, William	0	2	6
Williams, William F.	0	2	6

Port Elizabeth (Cape Colony).			
Willet, John A.	0	5	0

Porthcawl.			
Thomas, J. J.	0	5	0

Portishead.			
Frowd, Edward F.	0	10	6

Portobello.			
Kemp, David	0	10	6
Nesbit, John	1	1	0

Portsmouth.			
Parsons, William	0	10	6

Portsoy.			
Clark, James	0	5	0

Port St. Mary.			
Whineray, Edward	0	5	0

Preston.			
Barnes, L. R.	0	5	0
Barnes, T.	0	5	0
Carter, James (Bamber Bridge)	0	5	0
Foster, E.	0	5	0
Hinkley, E.	0	2	6
Miller, Nathaniel	0	5	0
Parker, Thomas	0	5	0
Ryder, John L.	0	5	0
Scott, Joseph	1	1	0
Sharples, George	0	5	0
Tomlinson Brothers	0	10	0
Waterworth, Alfred	0	10	6
Willan, William	0	5	0

Prestwich.			
Mercer, A.	0	10	6

Queenstown (Cape Colony).			
Mager, W. K.	0	10	6
March, William	0	5	0

Ramsey (Hunts.).			
Palmer, Frederick W.	0	5	0

Ramsgate.			
Franks, Alfred	0	5	0
Morton, Henry	0	5	0
Saunders, Charles J. H.	0	2	6

Reading.			
Bradley, Charles	0	5	0
Cardwell, E.	0	10	6
Craft, James	0	5	0
Cross, John	0	2	6
Davies, John	0	2	6
Hayward, William G.	0	5	0
Knowles, I. H.	0	5	0
Noad, Joseph	0	5	0
Powell, John	0	5	0
Rowell, John C.	0	5	0
Tunbridge, Frederick	0	5	0
While, William J.	0	5	0
Young, J. M. (Theale)	0	5	0

Reddish.			
Robinson, John T.	0	2	6

Redditch.			
Moule, William	0	5	0

Redhill.			
Sillitoe, F. S.	1	1	0

Retford.			
Baker, William	1	1	0
Clater, Francis	0	10	6

Rhymney.			
Dixon, Franklin	1	1	0

Richmond (Surrey).	£	s.	d.
Bletsoe, John	0	10	6
Clarke, Thomas M.	0	10	0
Hornby, Alfred	0	5	0
Lissiter, F. W.	0	2	6
Mumbray, R. G.	0	5	0
Parrott, John	0	10	6
Thacker, William	1	1	0

Richmond (Yorks).			
Thompson, John Thomas	0	5	0

Ringstead.			
Abington, Herbert J.	0	5	0

Ripon.			
Thornley, F.	0	2	6

Rochdale.			
Bamford, J. W.	0	5	0
Hadfield, James	0	5	0
Highley, William	0	5	0
Kerr, William	0	2	6
Mason, Arthur	0	5	0
Mercer, Thos. W.	0	5	0
Partington, William	0	2	6
Robinson, Ralph	0	5	0
Scott, W. H.	0	2	6
Taylor, Edward	0	5	0
Taylor, E. B.	0	2	6
Taylor, John	0	2	6
Whittaker, J. W.	0	2	6
Wood, John	0	5	0

Rochester.			
Barnaby, Henry	0	10	0
Foster, Alexander J.	0	5	0
Frost, John H.	0	5	0
Hewitt, Joseph S.	0	5	0

Rock Ferry.			
Dutton, John	0	10	0

Roehampton.			
Swain, James	0	5	0

Romford.			
Lasham, John W.	0	10	6
Pertwee, Edward	0	10	6

Romsey.			
Blissett, W.	0	10	6
Francis, George	0	5	0

Ross.			
Matthews, Thomas A.	0	5	0

Rothbury.			
Farrage, Robert	0	10	6

Rotherfield.			
Field, William	0	5	0

Rotherham.			
Horsfield, J. M.	0	5	0

Rothesay.			
Duncan, William	0	5	0
Macintosh, Archibald	0	5	0

Rugby.			
Chamberlain, A. G.	0	5	0
Lauder, Henry	0	5	0
Taylor, Robert	0	5	0

Rugeley.			
Hawkins, Henry F.	0	10	0

Ruthin.			
Magin, Arthur E.	0	2	6

Ryde (Isle of Wight).			
Brown, William Harry	0	2	6
Dixon, Henry	0	10	6
Flower, Thomas S.	0	5	0
Gibbs, William	0	10	6
Miller, Charles S.	0	5	0
Pollard, Henry H.	0	10	6
Smith, Tenison	1	1	0
Smith, William	0	2	6
Wallis, George	0	2	6

Rye (Sussex).			
Smith, Alfred W.	0	5	0
Waters, William A.	0	10	6

Saffron Walden.			
Machon, H.	0	15	6

St. Albans.			
Allenby, Henry	0	2	
Ekins, Arthur E.	0	10	6
Myers, L. J.	0	5	0

St. Andrews.	£	s.	d.
Cleghorn, Dr. H	0	10	6
Govan, Alexander	0	10	6
Kennedy, William	0	5	0
Kermath, W. R.	0	10	6
Kirk, John J.	0	2	6

St. Bees.			
Broomfield, R. W.	0	5	0

St. Blazey.			
Nettle, W. R. P.	0	5	0

St. Clears.			
Williams, Evan	0	10	6

St. Davids.			
David, Albert	0	2	6

St. Day.			
Corfield, Charles	0	10	6
Corfield, Thomas J. T.	0	10	6

St. Helens.			
Cotton, John	1	1	0
Harrison, James	0	5	0
Sherlock, Thomas	0	5	0

St. Just.			
Wearing, John	0	2	6

St. Leonards.			
Feaver, John	0	10	6
Maggs, F. W.	0	5	0
Maggs, Samuel B.	0	10	6
Neve, Francis C.	0	10	6
Skinner, W. M.	0	10	0
Thomas, Horace	1	1	0

St. Neots.			
Gudgeon, Geo. B. (Kimbolton)	0	5	0
Mellor, J. G.	0	5	0

Sale.			
Smith, Allen	0	5	0

Salisbury.			
Atkins, Samuel Ralph	1	1	0
Atkins, William R.	0	10	6
Hardy, R. E.	0	5	0
Newton, J. W.	0	10	6
Orchard, E. J.	0	10	6
Rowe, J	0	5	0
Westmoreland, W. H.	0	2	6

Saltash.			
Mathew, William H.	0	5	0

Saltburn-by-the-Sea.			
McLean, Kenneth	0	5	0
Taylor, William	0	5	0

San Remo (Italy).			
Squire, Frank R.	1	1	0

Sandgate.			
Jenner, William M.	0	5	0
Kennett, Edward	0	2	6
Walton, George C.	0	10	6

Sandwich.			
Baker, Frank	0	10	6
Dixon, William (Ash)	0	5	0
Williamson, J.	0	5	0

Sawston.			
Crampton, John	0	5	0

Scarborough.			
Chapman, Henry	0	5	0
Clare and Hunt	1	1	0
Cuttle, Arthur E.	0	2	6
Hughes, John E.	0	10	6
Smith, John F.	0	5	0
Whitfield, John	1	1	0

Seacombe.			
Holt, Richard W.	0	5	0
Walker, J. H.	0	5	0

Seaham Harbour.			
Storey, W.	0	5	0

Selby.			
Burton, John	0	5	0
Cutting, Thomas John	0	5	0

Selkirk.			
Dunn, Thomas	0	5	0

Settle.			
Shepherd, J. W.	0	5	0

Shaftesbury.			
Barry, Frederic	0	5	0

Shanklin (Isle of Wight).	£	s.	d.
Brown, Andrew Henry	0	10	6
Deeks, W. T.	0	2	6
Sheepshed.			
Moore, Thomas	0	5	0
Sheffield.			
Bradwall, J. H.	0	2	6
Carr, George	0	5	0
Clayton, William	0	10	6
Cubley, G. A.	0	10	6
Dunnill, G. H.	0	5	0
Ellinor, George	0	10	6
Elliott, John G.	1	0	0
Fletcher, Howard Bennett	0	10	6
Fox, A. R.	0	10	6
Froggatt, F. W.	0	2	6
Froggatt, John	0	2	6
Furness, Joseph M.	0	5	0
Hall, Thomas H.	0	10	6
Harrison, Henry	1	0	0
Learoyd, E. R.	0	5	0
Maxey, W. H.	0	5	0
Miller, John T.	0	5	0
Otley, John	0	10	6
Owen, George G.	0	10	0
Preston, Job	0	10	6
Priestley, Henry	0	10	6
Salisbury, John M.	0	10	6
Turner, John	0	5	0
Ward, William	0	10	6
Watson, H. J.	0	5	0
Watson, Robert W.	0	10	6
Westbrook, Dr. Charles	1	1	0
Wilkinson-Newsholme, G. T.	1	1	0
Shefford (Beds).			
Baigent, William Henry	0	10	6
Shepton Mallet.			
Cottrill, Gilbert Jones	0	5	0
Fudge, Charles William	0	5	0
Shields, North.			
Bambridge, A. J.	0	5	0
Burn, Thomas	0	2	6
Gibson, James	0	10	6
Hogg, Joseph F.	0	2	6
Irvin, William G.	0	2	6
Stobbs, Robert	0	10	6
Wilson. Richard H.	0	2	6
Shields, South.			
Forrest, Robert	0	10	6
Mays, Robert J. J.	0	10	6
Noble, John	0	5	0
Shifnal.			
Clarke, Thomas E.	0	5	0
Shildon.			
Veitch, Thomas D.	0	5	0
Shrewsbury.			
Adams, William	0	5	0
Blunt and Moses	1	1	0
Cross, William G.	1	1	0
Goucher, John	0	10	6
Goulbourne, William	0	5	0
Jones, William	0	10	6
Longhurst, Edward	0	5	0
Pattison, Henry	0	2	6
Salter, Joseph B.	0	10	6
Sidcup.			
Gordelier, Frank H.	0	10	0
Sidmouth.			
Chessall, Rowland	0	5	0
Silverdale.			
Wilson, Edward	0	5	0
Sittingbourne.			
Gordelier, William G.	1	1	0
Slough.			
Elliman, Samuel F.	0	10	6
Griffith, Richard	0	10	6
Smallthorne.			
Fletcher, Thomas	0	10	6
Snaith.			
Bean, John	0	10	6
Southam.			
Archer, Thomas	0	2	6

Southampton.	£	s.	d.
Bienvenu, John	1	1	0
Bishop, Samuel	0	5	0
Borchert, Heinrich T. G.	1	1	0
Culverwell. John S.	0	5	0
Dawson, Oliver R.	0	10	6
Fletcher, J. B. (Totton)	0	10	0
Fresson, F. H.	0	10	6
Hughes, J. H.	0	5	0
Humby, Lewis W.	0	5	0
Johnson, W. E.	0	2	6
Miller, J.	0	10	6
Mumford, Alfred	0	10	6
Pell, John	0	5	0
Randall, William B.	1	1	0
Rubie, J. T.	0	5	0
Spearing, James	0	10	6
Troake, C. F.	0	5	0
Southborough.			
Rogers, Oliver	0	5	0
Southend.			
Dawson, George R.	0	5	0
South Molton.			
Cocks, James	0	2	6
Swingburn, Richard H.	0	10	6
Southport.			
Ashton, William	1	1	0
Ball, Henry	0	10	6
Ellis, George	0	5	0
Gillett, Joseph	1	1	0
Horsefall, John	0	10	6
Kershaw, James	0	10	6
Loadman, James	0	5	0
Mainwaring, R.	0	10	0
Radley, William V.	0	10	6
Righton, James	0	10	6
Round, Frederick	1	1	0
Steel, Alexander	0	10	6
Surr, Edward	0	10	6
Sykes, Thomas H.	0	10	6
Whitworth, James	0	10	6
Wimpenny, James M.	0	5	0
Wright, Thomas D.	1	1	0
Southsea.			
Bridge, G. E.	1	1	0
Childs, James L.	0	10	6
Cruse, Thomas H.	1	1	0
Ford, Horace S.	0	5	0
Futcher, Alfred J.	0	10	6
Parris, T. W.	0	5	0
Rowell, Robert H.	0	10	6
Sangster, John G.	0	5	0
Sapp, John J.	0	10	6
Southwell.			
Downing, J. H.	0	5	0
Southwold.			
Critten, Robert P.	0	2	6
Sowerby Bridge.			
Stott, William	0	10	6
Spalding.			
Asling, Brelsford	0	5	0
Donington, Robert	0	5	0
Shadford, Major	0	5	0
Steeper, Samuel	0	5	0
Spennymoor.			
Burden, Thomas A.	0	5	0
Stafford.			
Averill, Henry Alcock	1	1	0
Averill, John	1	1	0
Stalybridge.			
Brierley, Richard	0	5	0
Simpson, Allwood	0	5	0
Stamford.			
Dickinson, Frederick	0	10	0
March, Frederick	0	5	0
Stevenage.			
Fresson, Lewis Francis	0	10	6
Stockport.			
Chemists' Association	1	1	0
Johnson, Thomas J.	0	5	0
Kay, Brothers	2	2	0
Lowndes, Hervey	0	5	0
Orton, William B.	0	2	6
Sidley, Thomas I.	0	10	6
Towle, Samuel	0	10	6

Stockton, South.	£	s.	d.
Fryer, John	0	2	6
Ronchetti, T. A.	0	5	0
Stockton-on-Tees.			
Allan, James H.	1	1	0
Bainbridge, Robert R.	0	2	6
Brayshay, Thomas	1	1	0
Brayshay, William B.	1	1	0
Thompson, Thomas	0	10	6
Thomson Brothers	0	10	6
Stoke-on-Trent.			
Adams, Frank	0	10	6
Adams, William H.	0	10	6
Harris, Robert H.	0	5	0
Jones, John	0	10	0
Wilson, Clement Fisher	0	5	0
Stone (Staffs).			
Jenkins, Thomas H.	0	10	6
Slater, Thomas	0	10	6
Slater, Thomas, jun.	0	5	0
Stoneham.			
Sutton, Charles W.	2	2	0
Stonehouse.			
Daymond, Samuel	0	2	6
Netten, Henry J. T.	0	5	0
Rossiter, John	1	1	0
Snell, H. B.	0	10	6
Stony Stratford.			
Cashmore, James F.	0	5	0
Cox, Julia Jane	0	10	6
Robinson, William H.	0	10	6
Stourbridge.			
Bland, Thomas F.	0	10	6
Burgess, William	0	5	0
Clark, Thomas P.	0	5	0
Hughes, Samuel	0	10	6
Jones, Rowland G.	0	5	0
Loverock, Henry	0	5	0
Morris, Alfred P.	0	10	6
Perks, Francis	0	10	6
Whitwell, George	0	5	0
Wyatt, John	0	10	6
Stowmarket.			
Gostling. George J.	0	10	6
Simpson, Robert G.	0	5	0
Wilson, Thomas	0	5	0
Stratton.			
Pickard, Henry	0	5	0
Strichen.			
Lee, Alexander M.	0	5	0
Strood.			
Picnot, Charles	1	1	0
Stroud.			
Blake, William Frederick	0	10	6
Coley, Samuel J.	0	10	6
Sunbury-on-Thames.			
Truman, H. V.	0	2	6
Sunderland.			
Aslin, John	1	1	0
Fairman, George P.	0	10	6
Fowler, William	0	2	6
Harrison, John	0	10	6
Harrison, W. B.	0	10	0
Hopper, Richard	0	2	6
Leadbetter and Son	0	2	6
Mitchinson, John	0	2	6
Purse, Alfred D.	0	5	0
Ritson, Thomas	0	10	0
Surbiton.			
Acfield, William	0	5	0
Mence, W. C.	0	10	0
Sutton-in-Ashfield.			
Littlewood, Samuel	0	5	0
Swaffham.			
Bell, Frederick R.	0	5	0
Finch, Jacob	0	10	0
Swansea.			
Bonnett, Frederick	0	2	6
Cule, Taliesin	0	10	6
Davies, John	0	5	0
Davies, John	0	10	6
Davies, John	0	2	6
Davies, J. M.	0	5	0
Evans, D. L	0	2	6
Frick, M.	0	5	0

Swansea—continued.	£	s.	d.
George, William	0	10	6
Grose, Nicholas M.	1	1	0
Hughes, James	0	5	0
Jones, H. Ellis	0	2	6
Jones, Moses	0	10	6
Keall, F. P.	0	10	6
Lloyd, John W.	0	5	0
Lowther, W.	0	5	0
Powell, D.	0	5	0
Rees, Daniel	0	5	0
Richards, J.	0	5	0
Roberts, J. K.	0	5	0
Williams, D.	0	5	0
Williams, J. T.	0	10	6
Yorath, Christopher	0	5	0
Swindon.			
Cook, W. R.	0	5	0
Green, John	0	5	0
Smith, William John	0	5	0
Tarporley.			
Aston, Walter	0	5	0
Taunton.			
Biffen, Thomas	0	10	6
Field, W. C.	0	10	6
Gregory, George H.	0	5	0
Hambly, Charles J.	0	10	6
Kirkpatrick, Samuel	0	5	0
Redman, Sidney	0	5	0
Sargent, John C.	0	10	6
Woollatt, Richard	0	5	0
Tavistock.			
Gill, William	0	2	6
Teignmouth.			
Cocking, Frederick J.	0	5	0
Cornelius, Joseph	0	10	6
Evans, Joseph J. O.	0	5	0
Pryer, H.	0	5	0
Tenbury.			
Slade, John	0	10	6
Tenby.			
Davies, Moses P.	0	5	0
James, George	0	5	0
Williams, William	0	10	6
Tewkesbury.			
Allis, Francis	0	5	0
Walker, Joseph	0	5	0
Wilkes, D. T. (Bredon)	0	2	6
Thame.			
Sutton, W. D.	0	5	0
Thirsk.			
Smithson, F. W.	0	2	6
Thornhill (N.B.).			
Fingland, James	0	5	0
Thornton Heath.			
Knott, Samuel	0	5	0
Thornton-in-Craven.			
Wilson, Thomas	1	1	0
Thrapston.			
Pars, R. C.	0	10	6
Titchfield.			
Smith, W. O.	0	10	6
Tiverton.			
Havill and Son	0	5	0
Rossiter, Thomas E.	0	5	0
Sanders, George Lee	0	5	0
Todmorden.			
Stevenson, W.	0	2	6
Torquay.			
Bathe, William	0	5	0
Bridgman, William Louis	0	5	0
Cocks, John W.	0	5	0
Cutmore, —	0	2	6
Farr, Edward H.	0	5	0
Guyer, James B.	0	10	0
Hearder, W.	0	5	0
Horton, Thomas	0	5	0
Knight, Benjamin	0	5	0
Ness, Thomas H.	0	5	0
Riches, Thomas	0	5	0
Shapley, Charles	0	10	0
Sloman, Richard	0	10	6
Smith, Edward	0	10	6
Smith, William	0	2	6
Taylor, John	0	10	6

Totnes.	£	s.	d.
Michelmore, P. W.	0	5	0
Morse, C. H. Stafford	0	5	0
Tredegar.			
Giles, Mrs.	0	2	6
Giles, William E.	0	2	6
Phillips, Charles L.	0	5	0
Treherbert.			
Jones, Rees T.	0	5	0
Trowbridge.			
Hayward, W. H.	0	5	0
Truro.			
Anstey, J. U.	0	5	0
Bucher, W. H.	0	5	0
Feaver, Samuel	0	10	6
James, Hamilton	0	5	0
Newby, Richard I.	1	1	0
Ninnis, T. M.	0	5	0
Percy, Thomas B.	1	1	0
Tunbridge.			
Gower, Alfred	0	10	0
Millidge, Thomas E.	0	10	6
Tunbridge Wells.			
Arnold, Spencer	0	10	6
Batting, Thos. G.	0	10	6
Cheverton, George	1	1	0
Dunkley, Edward	0	10	6
Howard, George W.	0	10	6
Howard, Richard	0	10	6
Mason, Michael	0	5	0
Sells, Robert J.	0	10	6
Whitrow, Benjamin	1	1	0
Tunstall.			
Keightley, Joseph	0	5	0
Tutbury.			
Green, Isaac	0	5	0
Tweedmouth.			
McIntyre, Peter S.	0	7	6
Twickenham.			
Alexander, William	0	5	0
Amoore, Lewis P.	0	10	6
Bishop, Thomas	0	10	6
Peake, Henry F.	0	5	0
Shelley, Henry	0	10	6
Twyford.			
Brooker, A. W.	0	5	0
Tynemouth.			
Atkinson, Joseph	0	5	0
Uckfield.			
Salter, Benjamin	1	1	0
Ulverston.			
Willan, Robert	0	10	6
Upton-on-Severn.			
Gibbs, John	0	10	6
Urmston.			
Duncalf, Richard	0	5	0
Usk.			
Marsh, G. W. F.	0	10	6
Uttoxeter.			
Johnson, John B.	0	10	6
Parker, Alfred	0	5	0
Woolrich, Charles B.	0	10	6
Ventnor (Isle of Wight).			
Littlefield, J. W.	1	1	0
Weston, Charles	1	1	0
Wadebridge.			
Philp, J.	0	5	0
Wakefield.			
Cardwell, James	0	5	0
Chaplin, John Lambert	0	10	6
Clarkson, B. F.	0	5	0
Duffin, Thomas	0	10	6
Hudson, Frank	0	5	0
Ibbotson, Fred	0	5	0
Moorhouse, Walter	0	5	0
Saville, George	0	10	6
Shaw, Mary	0	10	6
Smith, G. E.	0	10	6
Wice, J. H.	0	10	6

Wallingford.	£	s.	d.
Ashmall, George	0	5	0
Payne, Sidney	1	1	0
Upton, Eustace J.	0	10	6
Walmer.			
Wood, Henry	0	5	0
Walsall.			
Bate, Joseph William	0	5	0
Elliott, George	0	5	0
Partington, John J.	0	5	0
Walsham-le-Willows.			
Harrington, Arthur	0	5	0
Waltham.			
Teat, Thomas	0	5	0
Waltham Abbey.			
Griffiths, J. M.	0	10	6
Marshall, A.	0	10	6
Walton-on-Thames.			
Davies, C. E.	0	5	0
Power, Edward	0	10	6
Wantage.			
Marks, F. C.	0	5	0
Ware.			
Medcalf, Benjamin	0	10	6
Medcalf, Benjamin Pearce	0	10	6
Wareham.			
Marshallsay, Richard J.	0	5	0
Randall, Thomas	1	1	0
Warminster.			
Rogers, John M.	0	2	6
Rogers, Sydney	0	2	6
Warrington.			
Greenough, H. F.	0	2	6
Woods, J. H.	0	10	6
Young, John R.	0	10	6
Warwick.			
Hutton, Harry	0	2	6
Watford.			
Chater, Edward M.	1	1	0
Chater, Matthew Taylor	1	1	0
Cottle, Alfred James	0	5	0
Maries, H. D.	0	5	0
Wath-upon-Dearne.			
Hick, Allan	1	1	0
Watton.			
Vincent, Lacey A.	0	5	0
Weaverham.			
Manifold, John J.	0	10	6
Wednesbury.			
Gittoes, Samuel J.	0	10	6
Wells (Norfolk).			
Mann, George F.	0	5	0
Rump, Robert R.	0	5	0
Wells (Somerset).			
Manning, Richard James	0	10	6
Slater, Jonathan	0	5	0
Welshpool.			
Griffiths, Thomas	0	5	0
Welton.			
Myers, George Henry	0	5	0
Welwyn.			
Lawrance, Edmund	0	10	6
Wem.			
Bailye, W. R.	0	5	0
West Bromwich.			
Bullus, John	0	5	0
Haddock, Benjamin	0	10	6
Tunley, John	0	5	0
Westbury.			
Taylor, Stephen	0	2	6
Westbury-on-Trym.			
Collie, John C.	0	5	0
Westgate-on-Sea.			
Bessant, Frederick R.	0	10	6
Hutchinson, George B.	0	5	0

West Malling.	£	s.	d.
Oliver, Henry C. H.	0	2	6
Stedman, Richard B.	0	5	0
Weston-super-Mare.			
Parkes, Harry C.	0	5	0
Duckett, F. W.	0	10	6
Wetherby.			
Jackson, John	0	5	0
Weybridge.			
Griffin, Thomas	0	10	6
Weymouth.			
Cole, W. B.	0	5	0
Gregory, William	0	5	0
Groves, Thomas B.	0	10	6
Hill, Henry	0	5	0
Livesey, James T.	0	2	6
Smith, Joseph	0	5	0
Stedman, Samuel S.	0	5	0
Targett, Charles G.	0	5	0
Tottle, Henry John	0	5	0
Whitby.			
Corner, Thomas B.	0	10	6
Frank, John	1	1	0
Stevenson, John	0	10	6
Whitechurch (Hants).			
Bailey, John H.	0	2	6
Whitehaven.			
Wilson and Kitchin	1	1	0
Wick (N.B.).			
Miller, Kenneth	0	5	0
Wigan.			
Dawson, Francis Robert	0	5	0
Hothersall, John	0	10	6
Johnson, Thomas	0	10	6
Kellett, Richard E.	0	5	0
Litherland, H.	0	5	0
Phillips, Jonathan	0	10	6
Wilmslow.			
Charnley, Charles	0	10	6
Wimbledon.			
Dowdeswell, Jonathan	0	5	0
Spencer, W. G.	0	5	0
Wimborne.			
Huntley, G. F.	0	10	6
Jones, Henry	0	10	6
Winchcombe.			
Hall, Alfred L.	0	5	0

Winchester.	£	s.	d.
Barratt, F. J.	0	5	0
Knight, George E. Moses	0	5	0
Powell, Edward	1	1	0
Powell, Edward F.	0	10	6
Windsor.			
Collins, Henry G.	0	5	0
Dakin, John P.	0	2	6
Grisbrook, Edward	0	5	0
Harmer, J. D.	0	5	0
Russell, Charles J. L.	0	10	6
Westlake, Bernard	0	10	6
Wood, Robert	0	5	0
Wingate.			
Cross, John T.	0	10	0
Wingham.			
Palmer, Henry B.	0	5	0
Winslow.			
Parrett, Edward	0	5	0
Wisbeach.			
Maxey, John T.	0	5	0
Wishaw.			
Macfarlane, T. B.	0	5	0
Witham.			
Green, Robert P.	0	10	6
Ward, Francis E.	0	5	0
Witney.			
Purdue, Thomas	0	5	0
Wokingham.			
Spencer, Thomas	0	10	6
Wolverhampton.			
Cannell, William	0	10	6
Coleman, William	0	10	6
Fleeming and Son	0	10	6
Gibson, F. J.	0	5	0
Hamp, John	0	5	0
Stanway, Edward Thomas	0	10	6
Weaver, Alfred C.	0	10	6
Woodbridge.			
Betts and Son	0	10	6
Worboys.			
Nichols, Arthur F.	0	2	6
Worcester.			
Ferneley, Charles	0	10	6
George, Henry	0	10	6
Hall, Frederick J.	0	5	0
Hinks, John	0	10	6
Horniblow, W. T.	0	5	0
Kitson, Edward J.	0	10	6

Worcester—continued.	£	s.	d.
Lunn, Thomas	0	10	6
Masters, Charles	0	5	0
Steward, John A.	0	10	6
Timms, Mrs.	0	10	6
Twinberrow, John	1	1	0
Virgo, Charles	1	1	0
Workington.			
Bowness, William	0	5	0
Mason, Joseph R.	0	5	0
Worksop.			
Baxter, George	0	5	0
Jones, George W.	0	5	0
Wyatt, William	0	5	0
Worthing.			
Chaplin, Alfred	0	10	6
Cortis, A. B.	1	1	0
Wrotham.			
Romans, Thomas W.	0	10	6
Wycombe.			
Harding, Robert	0	5	0
Lansdale, John A.	0	5	0
Wilford, J.	0	5	0
Wyke.			
Drake, William	0	5	0
Wymondham.			
Skoulding, William	0	5	0
Yarm.			
Reed, George	0	10	6
Yarmouth.			
George, Alfred W.	0	2	6
Mornement, Henry J.	0	5	0
Poll, W. S.	0	2	6
Pratt, Edward J.	0	5	0
Steward, Alfred	0	5	0
Welch, Alfred E.	0	5	0
Yaxley.			
Farr, Joseph	0	10	6
Yeadon.			
Blatchley, Thomas	0	10	6
Yeovil.			
Harwood, Henry T.	0	10	6
York.			
Batty, Thomas	0	5	0
Capes, John Henry Cooper	0	5	0
Croskell, C.	0	10	6
Davison, Ralph, Executors of the late	1	1	0
Parker, Thomas	0	5	0
Saville, John	1	1	0
Wand, Thomas	0	5	0

DONATIONS RECEIVED DURING 1883.

	£	s.	d.
Atkins, Samuel Ralph, Market Pl., Salisbury	21	0	0
Barnett, John Arthur, 23, Cromwell Place, South Kensington, London, S.W.	5	5	0
Bird, Augustus, Wood Lane, Shepherd's Bush, London, W.	10	10	0
Buck, Thomas, Stamford Hill, London, N.	105	0	0
Fennings, Alfred, West Cowes, Isle of Wight	5	10	0
Humpage, Amelia (in memory of her Father, B. Humpage), 5, William's Terrace, Chiswick, London, W.	50	0	0
Ive, William, 115, Gloucester Road, South Kensington, London, S.W.	10	10	0
Jamie, Robert, Singapore	5	5	0
Matterson, Edward Hardwick, Bradford Road, Dewsbury	21	0	0
Maw, Charles, 7 & 12, Aldersgate Street, London, E.C.	105	0	0
Maw, Charles Trentham, 7 & 12, Aldersgate Street, London, E.C.	26	5	0
Probyn, Clifford, 55, Grosvenor St., London, W.	10	10	
Roberts, Jane Elizabeth, Malta Villa, Grove Road, Surbiton	5	5	0
Thomas, John Darby Dermott, Ashley Road, Bristol	5	5	0

ABSTRACT OF RULES IN REFERENCE TO VOTES AT THE ELECTIONS OF ANNUITANTS.

Annual Subscribers of—Half-a-crown are entitled at each election of Annuitants to ONE Vote.
" " Five Shillings ... ... TWO Votes.
" " Half-a-guinea ... ... FIVE Votes.
" " One Guinea ... ... TEN Votes.

And to increase in the same proportion.

Five Guineas are entitled to ... ... FIVE Votes for life.
Ten Guineas ... ... TEN Votes for life.

And to increase in the same proportion.

Should any Subscriber or Donor, or the widow of any Subscriber or Donor, become a Candidate for an annuity, such number of votes shall be placed to his or her credit, at the first succeeding election, as shall be represented by the whole amount of subscriptions or donations to the Benevolent Fund he or she (or, in the case of a widow, her husband) may have contributed.

Cheques and post office orders to be made payable to ELIAS BREMRIDGE.

FORM OF BEQUEST TO THE BENEVOLENT FUND.

"I give and bequeath the sum of unto the PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, *the same to be paid out of my pure personal estate, and to be applied for the purposes of the* BENEVOLENT FUND *of the said Society."*

FLETCHERS' Concentrated Liquors.

Opinions of Pharmacists.

From **Mr. D. S. EYNON, Dispensing Chemist,** LEAMINGTON.

I find the several **Concentrated Liquors** I had from you in every respect most convenient and satisfactory. The Syrups made from them are excellent.

May 5, 1880. D. S. Eynon

From **Mr. TOM WATERHOUSE, Dispensing Chemist,** UXBRIDGE.

I have thoroughly tested your **Concentrated Liquors**, and I cannot speak too highly of them. I now use them, to the exclusion of all other similar preparations, in my dispensary. They save time, are very reliable, and come as a boon to dispensing chemists. I get them regularly through my drug house.

July 8, 1881. Truly yours, Tom Waterhouse

From **Messrs. THOMPSON & WALTON, Dispensing Chemists,** MAIDENHEAD.

You are aware we have, from time to time, supplies of your **Concentrated Liquors** from you. You will be glad to learn we have every reason to be satisfied with, and grateful for them. In our opinion, however anxious chemists may be to obtain what is termed 'accurate dispensing,' it is obviously impossible, in other than large centres, for them to supply, with reasonable assurance, the irregular and, it may be, small demand for the numerous Syrups prescribed now-a-days, except through agencies such as yours.

November 26, 1883. Yours truly, Thompson & Walton

From **Mr. H. HITCHMAN, Dispensing Chemist,** KETTERING.

I have used your preparations now for a considerable time with great satisfaction, more particularly the *Liq. Ferri Iodid.* and *Liq. Ferri Phosph. Comp.*, which form the best Syrups I have met with.

July 7, 1881. Faithfully yours, G. H. Hitchman

From **Mr. S. LAWRENCE, Dispensing Chemist,** OBAN.

During the past year I have thoroughly tested most of your **Concentrated Liquors**, and have derived much satisfaction from their use, now finding my Syrups uniform in strength, appearance, and flavour; and as it is of the utmost importance that these qualities should predominate in all pharmaceutical preparations, I can confidently recommend your **Liquors** to all dispensing chemists.

Nov. 13, 1883. Yours faithfully, Samuel Lawrence

From **Messrs. HOPWOOD & SON, Pharmaceutical Chemists,** RICHMOND.

We have much pleasure in bearing testimony to the very satisfactory results which we have always obtained from the use of your valuable preparations. We have now used the **Concentrated Liquors** for some considerable time, and have never once heard any complaint arising from want of uniformity in the result obtained, a state of affairs scarcely possible under the old method of keeping the ready-made Syrups.

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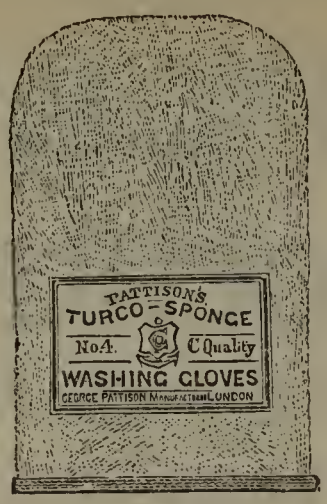

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&c., &c.

Prices per doz. pairs.

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Ottoman Bath Gloves (fancy brown and white—friction) 6/8
Criterion Bath Gloves (fancy brown and white) 6/8
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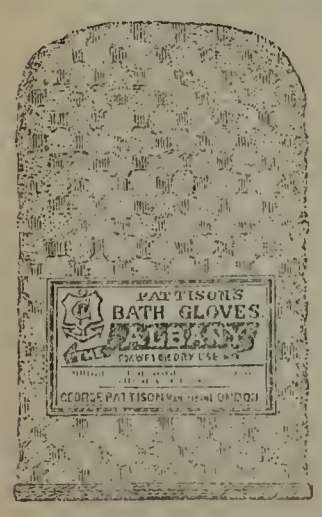

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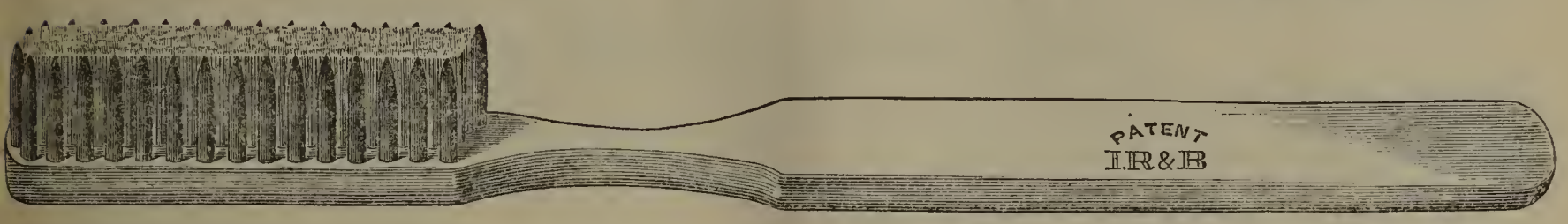

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From *The Journal of the British Dental Association,* January 15, 1884.

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We have received from Messrs. Maw & Co., of Aldersgate Street, specimens of a new pattern tooth-brush, with the above designation, which they are about to bring under the notice of the profession. The initials refer to the "India Rubber and Bristles," of which the brushes are composed. They consist of a narrow bristle brush of the ordinary type, surrounded by a single row of stems of soft red rubber of nearly the same length. They are both efficient and pleasant to use, and we should anticipate that the superior durability and elasticity of the rubber will afford so much support to the bristles as to keep them in shape and working order for a much longer time than an equally soft ordinary bristle brush would wear. The chief object of the rubber addition is, however, to prevent abrasion of the gums, and it appears to answer this purpose very satisfactorily. To persons with tender, or partially edentulous mouths, brushing the teeth is an unpleasant and even painful operation; Messrs. Maw's brushes will certainly reduce the discomfort in such cases to a minimum.

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RECOMMENDED BY EMINENT MEDICAL AUTHORITIES.

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Manufacturing Pharmaceutical Chemists, MANCHESTER.

WRIGHT'S LIQUOR CARBONIS DETERGENS

See Testimonials of entire Medical Press and from leading Dermatologists.

The Practitioner of September, 1881, reports a lecture entitled "Recent Advances in the Therapeutics of Diseases of the Skin," by W. A. JAMIESON, Esq., M.D., F.R.C.P. Ed. The following is an abstract therefrom:—"Itching, which owes its origin to too slow a current of blood, of which the most typical example is that seen in *Eczema* connected with varicose veins of the leg—but to the same category also many examples of Pruritus Scroti, Labiorum and Ani may be referred—is best relieved by careful flannel bandaging, well applied suspensory bandages, and laxative salts or mineral waters, which unload the rectal veins by freeing the portal circulation, combined locally with *weak tarry lotions*, one of the best of which is *Wright's Liquor Carbonis Detergens*, a well made *alcoholic solution of Coal Tar*, suitably diluted."

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DUVAL'S MILK BALSAM FOR THE HAIR.—A pretty novelty for ordinary daily use. It has the appearance of Milk, and is very agreeable in application, without the greasiness of lime juice preparations. It is not liable to separate, and is put up attractively in large bottles at 1/-, 1/6, and 2/6 each. Also Duval's Cosmetique.

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Extract from the *Court Journal*, July 7th, 1883.—"Mr. Biggleston, Chemist, of Mercery Lane, Canterbury, was on Wednesday, the 27th ult., honoured by receiving a warrant of appointment as Perfumer to Her Royal Highness the Princess of Wales. His Extract of Wood Violets, among his other perfumes, has made him a wide reputation, Continental as well as English. At the very first sniff there will be an exclamation of gratification at the sweetness and chaste delicacy of this perfume."

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2/6... Ditto	15/
4/6...Candes Lait Antéphélique	36/
4/6...Capsules, Bromide of Camph.	45/
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4/6... ,, Mathey Caylus Cubebe	28/
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2/3...Grauules Arsen. Acid	15/
2/3... ,, ,, Iron	15/
2/3... ,, ,, Soda	15/
2/9.. Grimault's Syrups	24/
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11/...Laville's Gout Tineture	90/
11/... ,, ,, Pills	90/
2/3...Papier Fayard	13/6
1/1½... Ditto	7/
4/0...Papier Fruneau	27/
2/3... Ditto	15/
1/9...Pâte d'Aubergier	14/6
2/0... ,, de Berthé	16/
2/9... ,, de Coca	23/

Retail	Per doz.
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1/1½... Ditto	8/6
1/9 .. ,, de Nafé	13/
1/9 .. ,, Regnauld	13/
7/0...Pierlot's Valerian	60/
2/9...Rabuteau's Dragées Ferrug	28/
7/0.. ,, Elixir Ferrug	65/
2/9... ,, Sirop Ferrug	27/
4/0...Racahout	30/6
4/6...Reynal's Bougies	42/
2/9...Ricord's Injection..	24/
4/6... ,, Capsules	38/
8/0... ,, Syrup	72/; 2/9; 26/
1/6.. Star Paper	12/
2/9...Vallet's Pills	22/
1/9 . Ditto	14/6
4/6...Veloutine (White, Pink, Yellow)..	39/
3/6... Ditto ditto	30/
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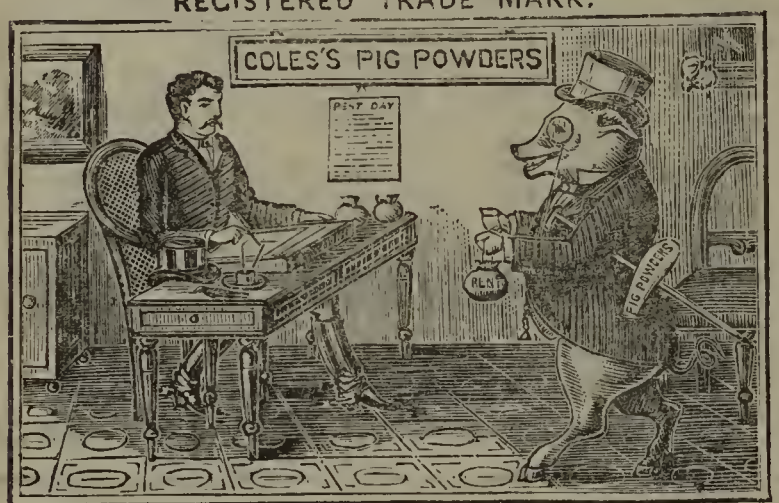

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MANGE, SURFEIT, ERUPTIONS, BLOTCH, LOSS OF COAT, AND ALL SKIN DISEASES IN

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ORDINARY SHEEP OINTMENT

As the season for Sheep salving has commenced we beg to call the attention of Chemists to our GENUINE SHEEP OINTMENTS, in the manufacture of which we have had over 40 years' experience.

We have all the latest and most improved machinery for the purpose driven by steam power, and guarantee the quicksilver to be well killed and evenly distributed, and none but the best lard used.

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VESICO SUDORIFIC (Registered) *will not blemish, but will, quicker than any other remedy, relieve and cure* Splint, Spavin, Ringbone, Sidebone, Capped Hock, Curb, Windgall, and strengthen the legs of Horses. Also for Tumours in Cattle. Price, 2/6 size 24/ per dozen; 5/ size 48/ per Doz., with usual discount.

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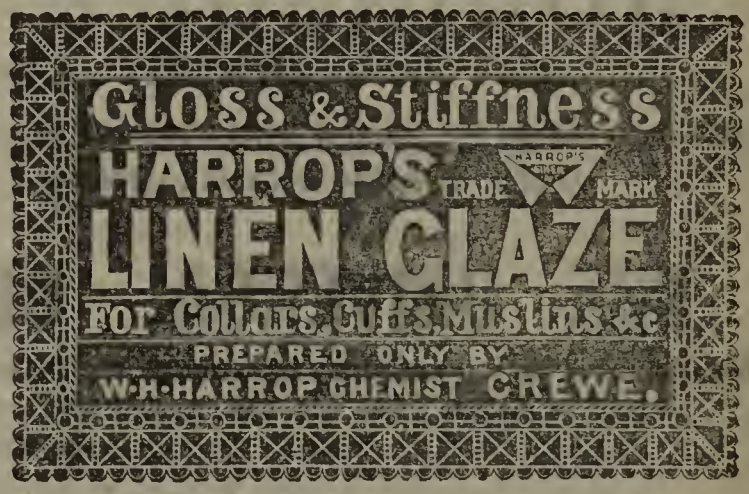

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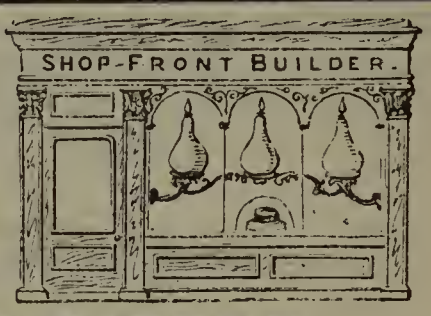

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SPANISH Mahogany Wall Cases, 3ft. 8in. long, 4ft. long, 6ft. long, 6ft. 6in. long, 8ft. long, 10ft. long, 13ft. 3in. long, 13ft. 6in. long, 14ft. 6in. long, 20ft. long, as A 86, 87, 88, Maw's; handsome Wall Fittings, A 82, 83, 84, all lengths; Drug Drawers, A 79, 80, all lengths; Retail and Dispensing Counters, all lengths, A 60, 61, 62, 63; Dispensing Screens, all lengths, A 54, 55, 56; handsome Dispensing Screens, mirror centre, case at each end, all lengths and designs; Show Cases, A 1, 3, 4, 5, 8, 9, 10, 12, 15, 18, 21, 23, 34, 35; Cases with and without Desks, A 31, 32; two 2ft. 4in. long upright Counter Cases, 3ft. 8in. high; Sponge Cases, A 41, 42, 43; Show Stands, A 37, 38, 40; Soda Water Stands, A 57; 35 Carboy and cylinder shape Show Bottles; quantity blue and olive Ointment and Ext. Jars; Specie and Show Jars; Stock Bottles; Lozenge Jars; Tincture Presses; Pill Machines; Mortars and Pestles; Percolators; Oil Cisterns; Tea and Coffee Canisters; Store Canisters, and every description of Shop Fittings and Utensils required by the Trade.

RAYNER'S HANDSOME £75 CHEMIST'S SHOP,

Fitted in London, complete with all new goods of the best design and manufacture. If out of London, men's expenses extra. If especially prepared for Export, suitable for any climate, including packing cases, and delivered to any of the London docks free, £85. Suitable for a Shop 14ft. long by 12ft. wide. Illustrated list post free.

LLOYD RAYNER, Shop Fitter & Show Case Maker,

10a & 46, DE BEAUVOIR CRESCENT, KINGSLAND, LONDON, N.

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MEDALS, LONDON, 1873. } **MUMFORD'S** { PARIS, 1875.

PURE CRUSHED LINSEED

19/- per cwt. bag included, or in 7, 14, 28 and 56 lb. Packages, 20/- per cwt. net, delivered free in London, and in tins 4/- per doz.

Best Quality. No Oil Extracted. Carefully Cleaned and Ground, so as to retain the natural colour of the seed without being heated.

FINEST QUALITY

PURE STARCH POWDER

In 7, 14, 28, 56 lb. and 1 cwt. bags, 28s. per cwt. net, bag included. Delivered free in London.

FINEST POWDERED

PURE FULLER'S EARTH

14/- per cwt. bag included, or in 7, 14, 28, 56 lb. Packages, 16/- per cwt. net, delivered free in London.

(SAMPLES POST FREE.)

GEORGE S. MUMFORD, Steam Mills, Farringdon Road, London, E.C.

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JOHN SAMPSON ROOTH,

WALTON CHEMICAL WORKS, CHESTERFIELD

MANUFACTURER OF

NAPHTHA, ACETIC ACID, ACETATE OF LIME, SUGAR OF LEAD, IRON LIQUOR (*Acetate of Iron*), CHARCOAL, MOULDERS' BLACKING, COKE AND COAL DUST, &c.

BURROUGH'S SPIRITUS RECTIFICATUS, P.B.

SPIRITS OF WINE CHEMICALLY PURE

The Best English Grain Spirit, free from Fusel Oil.

56 over proof, 19/7 net, prompt Cash, for 5 gallon quantities; also Finest Orange Wine and Sherry for medicinal purposes.

CALE STREET DISTILLERY, LONDON, S.W.

Duty free for Exportation—also best Methylated Spirit at lowest prices.

TRADE MARK.

R. J. FULLWOOD & BLAND

(Late R. J. FULLWOOD & CO.)

The Original Inventors of the Prime, Rich, Golden-colour Cake and Fluid Extract of

ANNATTO.

31, BEVENDEN ST., HOXTON, LONDON.—*Established 1785.*

None genuine without the Trade Mark, "A Stag with Olive Branch." Amsterdam Exhibition, 1883, Honourable Mention. Cork Exhibition, 1883, Medal, highest award.

CARMINE—SPECIAL.

AT EXTRAORDINARY LOW PRICES.

Specialities for Colouring, Powders, Pastes, Solutions, &c. In three qualities—640 lbs. at 17/6, 560 lbs. at 20/6, 436 lbs. at 27/6 per lb. Pure and perfectly soluble in Ammonia, and of a rich colour.

ROUGE CARMINE

In three qualities—320 lbs. at 32/6, 260 lbs. at 38/6, 190 lbs. at 44/6 per lb.

In strength of colour and richness of tint this is the highest quality of Carmine obtainable.

The whole of this Carmine is manufactured from the finest quality Cochineal. The difference of quality is in degree of strength and tint. Having taken advantage of the late low price of Cochineal, I can quote above reduced prices. Trial lb. supplied for price quoted, carriage paid, or specimen ¼ lb. 5/3, 6/3, 7/3, 8/3, 10/-, 12/-. The charge for sample ¼ lb. will be deducted off all orders of 7 lbs. and upwards. Terms, nett cash, or London references. Satisfaction guaranteed. Offered subject to being on hand. **Samples Free.**

C. A. MORRIS, 28, Featherstone Street, London, E.C.

BRYANT AND MAY'S
MATCHES
WAX VESTAS AND CIGAR LIGHTS
DECORATED TIN WARE

OF ALL DESCRIPTIONS

MANUFACTURED BY THEIR PATENT PROCESS.

Lozenge Boxes, Pill Boxes, Seidlitz Powder Boxes, Tooth Powder Boxes,
&c., &c., &c.

11 PRIZE MEDALS.

FAIRFIELD WORKS, BOW, E.

Illustrated Price Lists on application.

"Hunter's" Infallible Vermin Destroyer

IS THE MOST DEADLY.

Cannot be excelled.

Thirty-seven years' reputation.

Always gives satisfaction.

SUPPLIED ON THE BEST TERMS
BY ALL THE
WHOLESALE HOUSES.

From Mr. JAS. THOMPSON, Low Hesket, near Carlisle, to Mr. R. T. PATTINSON, Chemist, Carlisle :—"Sir,—You can with confidence recommend 'Hunter's Vermin Destroyer.' It is the best thing I ever used, having often cleared stack-yards of both rats and mice in a day or two."

Manufactory: Westgate & Union St. DEWSBURY, ENGLAND

STORRY, SMITHSON & CO.

Paint, Colour & Varnish Manufacturers,

Tar, Turpentine, and Resin Distillers, Oil Merchants, Oil Refiners and Boilers.

Makers of PURE CRUSHED LINSEED with all the Oil in.

READY MIXED PAINTS (various Shades) put up in 1lb., 2lb., 7lb. & 14lb. Tins

WORKS—BANKSIDE, SCULCOATES.
OFFICES—PRINCE'S CHAMBERS, HIGH STREET, HULL.

Established 1831. Samples and Prices on application.

BOURNE, JOHNSON & LATIMER direct SPECIAL ATTENTION to a few of their most saleable goods, suitable for the present season. Chemists who wish to increase their returns, who have not seen these goods, are invited to make up a small sample order, as they are "having a run."

The New Night Lamp and Food Warmer

Is the cheapest Lamp ever offered to the Public.

Price 22/- per doz.

Consumes about a Penny-worth of Petroleum Oil per week.

The New Earthenware Inhaler,

With Burnt-in Directions for Use.

Price 18/- per doz.

The only one that can be sold at 2/6.

Chlorate of Potash Pearls.

One dozen in a Glass Top Box, 4/- per dozen.

Glass Throat Spray

With Indiarubber Ball and Tube.

Price 27/- per doz.

The Ladies' Sanitary Pad.

(Absorbent Cotton Wool.)

Per gross 14/- ; Retail at 2/- per doz.

The Ladies' Calendar Belt,

Suitable for using with above. Per doz. 14/-

These only need an introduction to secure a permanent sale.

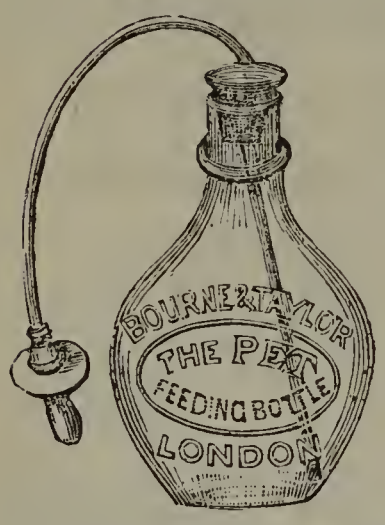
Mentholeum.

In Paper Cases, per doz. 4/-

In Nickel-Plated Pots, per doz. 8/-

Filled Watch-shape Smelling Bottles.

English Stoppered Bottles, per doz. 4/-, 7/-



THE "PET" FEEDING BOTTLE

Is made in a variety of styles, the most saleable of which are the

No. 6	Bent Neck, with Wood Top Cork, White Fittings	per doz.	3/6
„ 7	„ „ „ Black „	„	3/9
„ 10	„ Screw Glass Stopper, White „	„	4/–
„ 11	„ „ „ Black „	„	4/3
„ 14	„ Shilling Size, in Handsome Box, Pot Caps ...	„	7/6
„ 17	„ Screw Glass Stopper, White Flint, Black Fittings	„	8/–
„ 19	„ „ Metal Caps „ „	„	8/–
„ 20	„ „ „ Gilt Caps „ „	„	12/–
„ 21	„ China Caps, Gilt Mounts „ „	„	12/–

SPECIAL QUOTATIONS TO LARGE BUYERS.

Japanese "Curl" Papers ... ... 4/- doz.
„ Sanitary „ ... ... 8/- „
Antiseptic Respirators, as Dr. Coghills, 16/- „

Pumice Stone Soap Tablets.

3 doz. in a Counter Box.
Per doz., 1/6.

All the above Goods bear a very good profit, and are specially recommended as being very saleable.

10 PER CENT. FOR CASH.

Having extended our Premises by the addition of the adjoining Warehouse, we are prepared to execute all orders promptly. We invite attention to our Show Rooms, and shall be glad to be favoured with a visit from our Country Friends.

BOURNE, JOHNSON & LATIMER

(SUCCESSORS TO BOURNE & TAYLOR),

WHOLESALE AND EXPORT DRUGGISTS' SUNDRIESMEN,

34 & 35, CASTLE STREET, HOLBORN, LONDON, E.C.

S. MAW, SON & THOMPSON'S
FEEDING BOTTLES

Patented in England, December 4, 1879;
Patented in the United States, April 27, 1880.

The ALEXANDRA (Earthenware Cap).

The EXPORT (Glass Screw Stopper).

		White Fittings.			Black Fittings.		
Alexandra, Earthenware Caps - -	*per doz.*	—	7/6	11/-	—	8/6	12/-
Alexandra, Earthenware Screw Stoppers	,,	—	—	11/-	—	—	12/-
Alexandra, Glass Screw Stoppers -	,,	4/-	7/6	11/-	4/9	8/6	12/-
Export, China or Wood Top Corks -	,,	3/6	—	—	4/3	—	—
Export, 2nd Quality, Wood Top Corks	,,	2/9	—	—	3/6	—	—
Export, Earthenware Caps - -	,,	—	7/3	—	—	8/3	—
Export, Glass Screw Stoppers - -	,,	4/-	7/6	—	4/9	8/6	—

FOR FURTHER PARTICULARS SEE QUARTERLY PRICE CURRENT, pages 69 and 70.

SPECIAL QUOTATIONS TO WHOLESALE BUYERS.

S. MAW, SON & THOMPSON, LONDON

BETTS & CO. LIMITED

(ESTABLISHED IN 1840),

SOLE MAKERS IN GREAT BRITAIN OF

METALLIC CAPSULES,

AND PATENTEES OF THE

Coloured Side Mark, Label, and other Speciality Capsules

(For the Prevention of Fraud and Refilling of Old Labelled Bottles)

As supplied to Bass & Co., and the leading Brewers and Bottlers of Wines and Spirits throughout Europe.

PLAIN ORDINARY CAPSULES,

For Small Phials, **2s. 6d.** and upwards per 1000, according to size, style, design, and quantity.

SPECIAL CONTRACTS FOR CONTINUOUS DEALING.

MANUFACTURERS OF

PURE ENGLISH MADE BOTTLING AND PACKAGE TINFOIL

From **1s.** per lb., and upwards. **MIXED FOIL** (Foreign Quality), from **6d.** per lb. (according to gauge).

PATENT BARREL PACKAGES AND SNUFF CANISTERS, &c.

MANUFACTORIES:

LONDON :—Chief Office and Factories, Wharf Road, City Road, E.C.; and Holloway and Batavia Mills, Holloway, N.W.
BIRMINGHAM :—Moor Green Fields.
PARIS :—Office, 4, Rue Mogador, Chausse D'Antin.
BOURDEAUX :—Office, 3, Quai de Chartrons; Factory, Monrepos, Floirac.

PATENTEES OF

Hydraulic and Mechanical Pressure Capsuling Machines,

ESPECIALLY ADAPTED FOR CHEMISTS' COUNTERS,

Largely in use by the Tradc, and efficiency guaranteed for all sizes of Bottles, at Royalties from **5s.** to **£2 2s.** per annum.

W. GIBSON & CO.

Surgical India Rubber Manufacturers,

75, MORTIMER ROAD,

KINGSLAND, LONDON, N.

Manufacturers of and Dealers in all kinds of Instruments and Sundries of which India Rubber forms the whole or a part, viz.: Bandages, Enemas, Elastic Syringes, Feeding Bottles, Finger and Thumb Stalls, Pessaries, Spray Producers, Tubing, Teats, Ice Bags and Caps, Sponge Bags, Urinals, &c.

To Buyers who prefer to go to the cheapest market and to pay cash against goods, W. G. & Co. offer the best possible advantages, according to the nature and magnitude of the transaction.

New Price List will be ready 2nd March.

AUSTIN'S PATENT POCKET INHALERS

AND CARBOLATE OF IODINE FOR USE THEREWITH,

ARE IN CONSTANTLY INCREASING DEMAND.

Dr. Horace Dobell, in his recent work "On Loss of Weight, Blood Spitting, and Lung Disease," says (at page 124, 2nd Edition), in reference to Antiseptic Inhalations,

"One of the best means of using these is Austin's Pocket Inhaler."

Prices 3/6, 5/6, 10/6 and 21/- each.

Extra Bottles of Carbolate of Iodine, 1/- and 2/- each. Extra Tubulettes, 1/- each, or 5/- per half dozen.

Sold Wholesale by S. MAW, SON & THOMPSON. *See Price List.* And may also be had of all the leading Patent Medicine Warehousemen.

PRIZE MEDALS, INTERNATIONAL EXHIBITIONS.

LONDON, 1862. PARIS, 1875. PHILADELPHIA, 1876. PARIS, 1878. SYDNEY, 1879. MELBOURNE, 1880.

KILNER BROTHERS

MANUFACTURERS OF

GLASS BOTTLES

VAN BOXES, CASES, &c.

Respectfully invite attention to the following Goods that they supply:

DISPENSING BOTTLES	**Green Flint.**—Flats, Ovals, Octagons, Rounds, Direct Squares. **White Flint.**—Vials—tall, medium, and squat series. Round Shoulders. Octagon, Homœopathic, Wide Mouth. **Blue Glass.**—Poisons—octagon and flat.	DISPENSING BOTTLES
FEEDING BOTTLES	**"Our Babies' Bottle,"** in green and white glass. **"Our Darlings' Bottle,"** in white glass. All with white, brown, or black fittings.	FEEDING BOTTLES
PERFUMERY BOTTLES	**White Flint.**—Lubins, Essences—oval, flat, round, pyramid and toilet. Eau de Luce, Lavenders, Panel Flats, Preston Salts, Watch Perfumes, Toilet Vinegars, Pomades all kinds, Eau de Colognes.	PERFUMERY BOTTLES
CHEMISTS' BOTTLES	**Pale Green.**—Panel Flats, Salines. **Blue Glass.**—Citrate of Magnesia. **White Flint.**—Kalies, Rounds wide mouth, Marking Inks, Round Oils, Shop Rounds, Ether Rounds, Show Carboys, Syrups, &c., &c.	CHEMISTS' BOTTLES
SUNDRIES	**Glass.**—Measures—conical, cylindrical, cup bottom, tumbler, wine and minim. Funnels, Mortars and Pestles, Stirring Rods, Nipple Shells, Test Tubes, Eye Baths, Spirit Lamps, Sample Tubes, Tube Vials. **Earthenware.**—White Covered Pots—ordinary, thin, tall, and thick. Also labelled Cold Cream. **White Opal Glass.**—Covered Pots, ordinary. **Corks.**—A good selection of sizes and qualities. **Parcels Post Boxes**—to suit all Bottles.	SUNDRIES

Also Wholesale Druggists', Oil, Tap, Pickle, Sauce, Vinegar, Wine, Spirit, Beer, Mineral Water, Common and other Bottles, Syphons, Van Boxes, Cases, &c.

NOTICE.—WE PUBLISH

FOR HOME TRADE	**Monthly.**—A 12-page Circular, containing full particulars of our goods, in which attention is invited to new kinds as they are added, and prominence given to goods in season. **Quarterly.**—Price List of Dispensing, Feeding, Perfumery, and Chemists' Bottles and Sundries. **At Intervals.**—Price Lists of other Goods as mentioned above, in separate sections for different trades.	FOR HOME TRADE
FOR EXPORT TRADE	**At Intervals.**—Illustrated Catalogues of all our goods. **Quarterly.**—Illustrated Price List (nearly 50 pages), full of information for Foreign Buyers.	FOR EXPORT TRAD

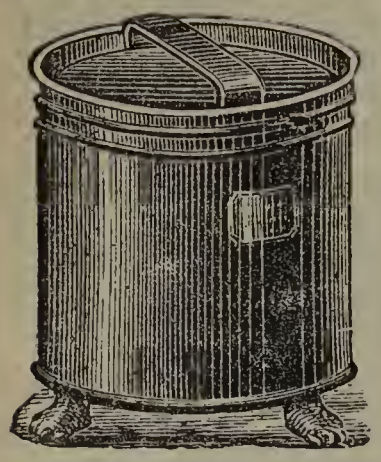
ORDERS FROM THE HOME OR FOREIGN TRADE WILL HAVE CAREFUL ATTENTION

KILNER BROTHERS

No. 6a, Gt. Northern Goods Station, King's Cross, London.

DOLBY'S PATENT

BEEF TEA & GRAVY EXTRACTOR

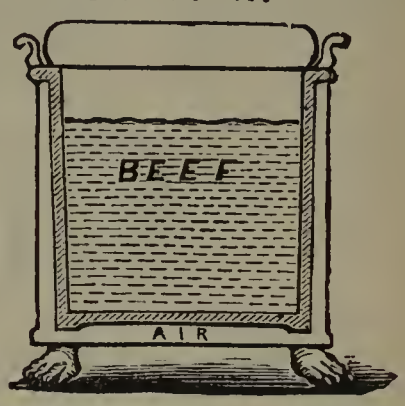


The arrangeme t of this most useful apparatus is such that the heat maintained is exactly the right degree to ensure the "extraction" of every particle of nourishment from meat of all kinds, and the result is a true, rich, and highly nourishing gravy, which will entirely supersede the unpleasant and unsavoury preserved extracts of meat now often resorted to for want of a simple apparatus to make rich fresh beef tea and gravies at home.

Sizes, 1¼, 2, 4, and 12 pints.

The above may be obtained through any respectable Ironmonger.

SECTION.



Manufactured by **GRIFFITHS & BROWETT**

BRADFORD ST., BIRMINGHAM. 21, MOORGATE ST., LONDON. 47, AVENUE PARMENTIER, PARIS.

ESCHMANN BROS. & WALSH,

INVENTORS AND MANUFACTURERS OF THE

SOFT SILK FLEXIBLE CATHETERS WITH WOVEN EYES

To be had of all Surgical Instrument makers.

VACCINE LYMPH.—Guaranteed pure; eighth day; collected from healthy children only. As supplied for twenty years to the Profession; also to Hanwell, Earlswood, and other Asylums, Prisons, Foundling, Royal and United States Navies, Demerara Government, Vaccine Institutions at Cape Town, India, China, Australia, Japan, Borneo, Spain, &c. Testimonials shown on application. Three tubes, post free, 2s. 6d. Points, 3s. doz. Calf Vaccine Lymph, in tubes, 1s. and 2s. each. Calf Vaccine, on Points, 6s. doz. Sent post free only on receipt of remittance. Discount to the Trade. Lymph not approved or spoilt in transit exchanged free.

W. FAULKNER, M.R.C.S.,
16, Endell Street, Bloomsbury, LONDON.

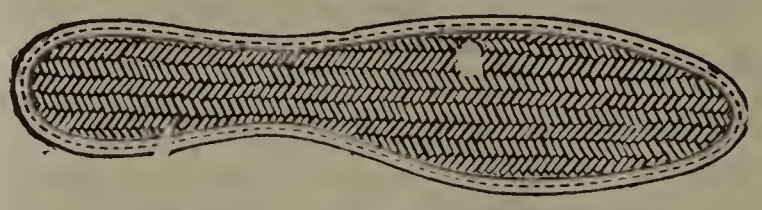
THE PERFECT SURGICAL BANDAGE

Preferred to all Makes hitherto used.

In Cases of Twelve Six Yard Rolls, 2 inches wide, 3s. 9d.; 2½ inch, 4s. 6d.; 3 inch, 5s. 6d.; or, case containing twelve six yard rolls of each width, 13s.

Free by post, to any address in the United Kingdom, for prepaid orders only. Manufactured by
The BOLE HALL MILL CO., Tamworth, Staffordshire.

E. PENTON & SON'S STRAW SOCKS



HIGHLY RECOMMENDED FOR

Cold Feet, Chilblains, Rheumatism, &c.

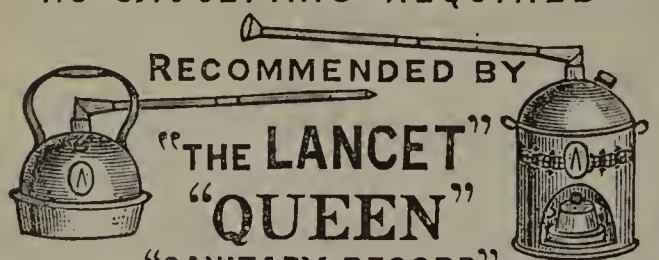
May be obtained of—

BARCLAY & SONS, 95, Farringdon Street, E.C.
BOURNE & TAYLOR, 35, Castle Street, Holborn, E.C.
EDWARDS & SON, 157, Queen Victoria Street, E.C.
HOVENDEN & SONS, 31 & 32, Berners Street, W.
LYNCH & Co., 192, Aldersgate Street, E.C.
MAY, ROBERTS & Co., Cowcross Street, E.C.
SANGER & SONS, 150, Oxford Street, W.

HIGHEST AWARD International Medical and Sanitary Exhibition, 1881.
SILVER MEDAL (HIGHEST AWARD) National Health Society, 1883.

J. ALLEN & SON'S BRONCHITIS KETTLES.

NO SAUCEPANS REQUIRED



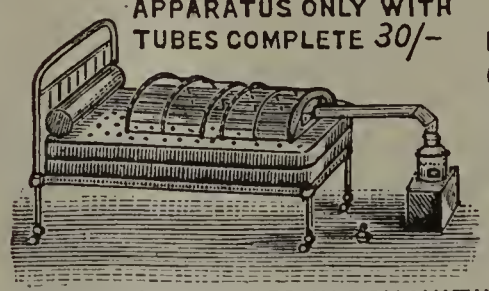
FOR USE OVER FIRE 7/6 — HOLD 5 PINTS — WITH STAND AND LAMP 15/-

NO HOUSEHOLD SHOULD BE WITHOUT ONE

J. ALLEN & SON'S PORTABLE TURKISH BATH.

CAN BE USED FOR HOT AIR ONLY, HOT AIR AND VAPOUR COMBINED, OR FOR A MERCURIAL OR ANY MEDICATED BATH.

APPARATUS ONLY WITH TUBES COMPLETE 30/-



FOR RHEUMATISM, GOUT, ECZEMA, LUMBAGO, SCIATICA, AND SKIN, LIVER, AND KIDNEY AFFECTIONS.

APPARATUS FOR BED IN BOX WITH PAIR OF WICKER FRAMES 45.s

APPARATUS FOR USE UNDER CHAIR, WITH BEST CLOAK TINNED IRON SUPPORTS IN BOX 50/s

FULL PARTICULARS WITH MEDICAL AND PRESS OPINIONS POST FREE.

JAMES ALLEN & SON, 21 & 23 (late 64 & 65), Marylebone Lane, Oxford St. London, W.

NEW GOODS.

Special Notice to the Trade.

We beg to notify that the Proprietors of Lundborg's Perfumes have appointed us their Sole European Agents.

The LUNDBORG'S PERFUMES have gained such popular favour in other countries, that we anticipate for them an equal appreciation in the United Kingdom by people of refinement and good taste.

OTHER ODOURS—

MARÉCHAL NIEL ROSE } 2 oz. Bots., 33s. per doz.
EDENIA ... ... }
FASCINATION ... ... 1 oz. Bots., 21s. per doz.

1 oz. Bots., 21s. per doz.

In America these goods occupy pre-eminently the first rank for quality above any foreign perfumes.

For Delicacy, Richness, and Permanency Lundborg's Extracts certainly have no equal.

The rare excellence of quality, combined with the elegant and tasteful style in which they are put up, renders them at once attractive and readily saleable.

As novelties in this market, the trade will, we believe, be glad to introduce them, as they yield a good profit and do credit to the introducer.

THE ENTERPRISE TINCTURE PRESS.

Specially adapted for Coarse and Fibrous Drugs.

The principle upon which this Press operates is, that the drug is acted upon in a continuous thin layer which is forced forward by each revolution of the screw into smaller and smaller space, the leverage yielding a force so powerful as to extract almost the entire moisture, delivering the residue of suitable drugs with almost crisp dryness, and, as experience has shown, it saves a greater amount of Tincture (very important in the case of Tincture of Opium and other expensive drugs) than even the most powerful Hydraulic Press. So thorough is its action in this

respect that the *Chemists' Journal* has humourously remarked of it that "it will almost squeeze blood out of a turnip." One firm informs us that they have saved at least £20 more in three months, by the use of this Press, than they could secure by using any other. The working of this Press being continuous, either small or very large quantities may be operated upon at one time, and much more rapidly than in any other form of apparatus.

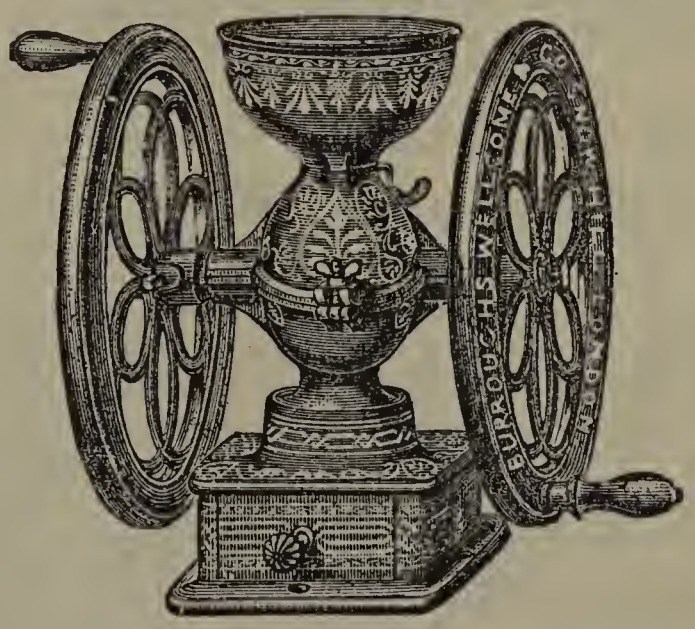
The fact that drugs require handling but once, that the use of press cloths is done away with, and that the operation is continuous, shows a great advantage in this Press over any other.

Price 15 shillings, subject to the usual Discount. Obtainable from every Wholesale Druggist.

THE ENTERPRISE DRUG MILL.

Constructed on an improved principle, the cutters being easily removable for inspection, or for cleaning. It may be regulated to grind to any degree of fineness or coarseness, by simply turning a single thumbscrew. It is adapted to almost any dry pulverizable substance; it works rapidly, and is economical.

Professor MAISCH, one of the highest American authorities on pharmacy, says that "It is the best drug mill that has yet been devised. It is intended to displace the use of the mortar for general purposes in pulverizing drugs."



Prices { Plain ... ... 40s., 60s., 100s. / Ornamented 50s., 70s., 110s. } each.

Subject to the usual Discount for Cash.

All of the Articles mentioned above may be obtained from any respectable wholesale firm, or from BURROUGHS, WELLCOME & CO., of SNOW HILL BUILDINGS, LONDON, E.C., the Sole European Depôt.

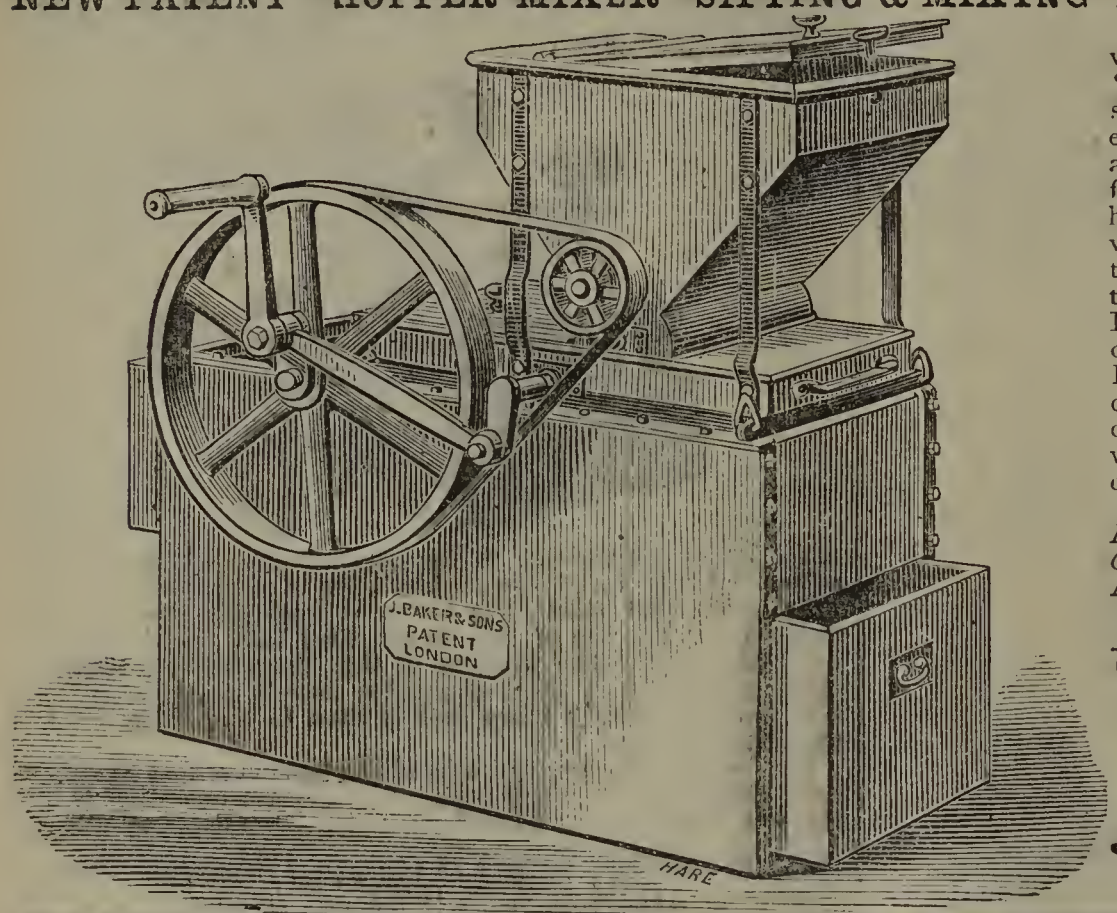
BAKER'S PATENT SIFTING AND MIXING MACHINES

Protected by Letters Patent in the United Kingdom of Great Britain and Ireland, France, Belgium, the United States, Canada, &c., and now used in all parts of the World.

These machines combine the advantages of the *Finest Sieves* with those of a *Perfect Mixer*. Finer Powder and more intimate mixtures can be produced than is possible by any other process, while for rapidity of action and the entire avoidance of waste and dust in the operation—they stand unrivalled.

The machines are provided with seven different meshes of sieves, from which a selection of four is *usually* made, forming the "ordinary set." The finer sieves are used for Camphorated Chalk, Violet Powders, Aromatic Powders, Gregory's, Tooth Powders, Dover Powders, and all finest compounds; while the medium and coarser sieves are used for Seidlitz, Lemon Kali, Sherbet, Baking Powders, Curry Powders, Pill Powders, Horse and Cattle Mixtures, preparing Tinctures, &c. The sieves can be instantly changed for other meshes, and the machines readily cleaned.

NEW PATENT "HOPPER MIXER" SIFTING & MIXING MACHINE. Nos. 4a, 5a & 6a Machines.



These Machines are provided with Double Revolving Mixers in the Hopper, in addition to the "Agitator Mixers," and Sieves, as in the other sifting and mixing machines. They therefore ensure the *most perfect mixing possible*, and are adapted for Large Wholesale Dealers and Manufacturers. The materials being put into the hopper, they are first roughly mixed by the revolving mixers, then they fall to the sieve where the mixing and sifting is completed by the agitators; the material passing into the Receiving Drawer below. The Gruff is discharged into the drawer in front, without stopping the machine. It is easily cleaned, and the sieve can be instantly changed for other meshes. Any material that requires sifting and mixing, or sifting only, can be worked in this machine, in the largest or smallest quantities.

MORTON'S PATENT LIQUID AND COMPOUND MIXER, for Cold Cream, Pomades, Ointments, Emulsions, Chemicals, Colours, Inks, Soaps, Sauces, &c.

DRUG MILLS, SUGAR MILLS, AMMONIA MILLS, TINCTURE PRESSES, PILL COATERS, MORTARS, PHARMACEUTICAL STILLS, SCALES AND BALANCES.

GAS ENGINES, SHAFTING, AND FITTINGS.

Estimates and Price Lists on Application.

JOSEPH BAKER & SONS,
ENGINEERS & PATENTEES,
58, CITY ROAD, LONDON, E.C.

A GOLD MEDAL HAS BEEN AWARDED TO P. H. BRACHER & CO. WINCANTON,

For the "**DESIDERATUM**" **MIXER**

Send for Price List post free from P. H. BRACHER & CO. 77, HIGH STREET, WINCANTON.

Feeding Bottles.

The "ECLIPSE."

White Fittings, 30/- per gross.
Best Black Fittings, 38/- "

These are put up in One Dozen Wood partitioned Boxes.

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GLASS BOTTLE MANUFACTURERS,

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GLASS BOTTLES of EVERY DESCRIPTION, either PLAIN or STOPPERED, made in WHITE, BLUE, AMBER, ACTINIC GREEN, or any other colour required.

SPECIAL ATTENTION GIVEN TO QUALITY.

Quotations, post free, to any part of the world on application.

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"OUR LITTLE PETS" FEEDING BOTTLE

Fitted with Best Glazed Earthenware Caps.

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White Fittings, 84/- per gross.
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Price 2/6 and 4/6.

TRADE MARK. **A. J. HEALD, M.P.S., Burnham, Bucks.** London Depot: 195, Farringdon St.

J. W. PINDAR'S
NEW ROTARY PILL MACHINES

As now used by Messrs. Holloway, Cockle, Cox; and all the principal Pill Makers in England, Australia, America, and France.

ROTARY MACHINE, Fig. A.

Fig. B.

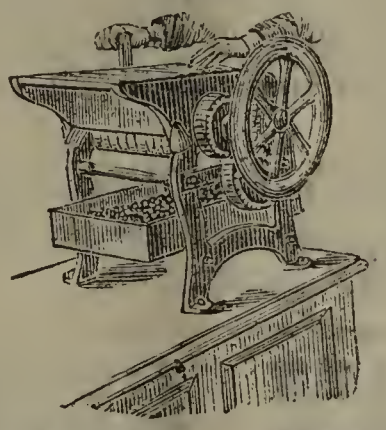

Fig. B.—A small useful Machine, capable of making 10 lbs. of Pills per hour, particularly adapted for persons making small quantities, at **£7 15s.** Press suitable for same, **£2 15s.**

PIPING PRESS, Fig. C.

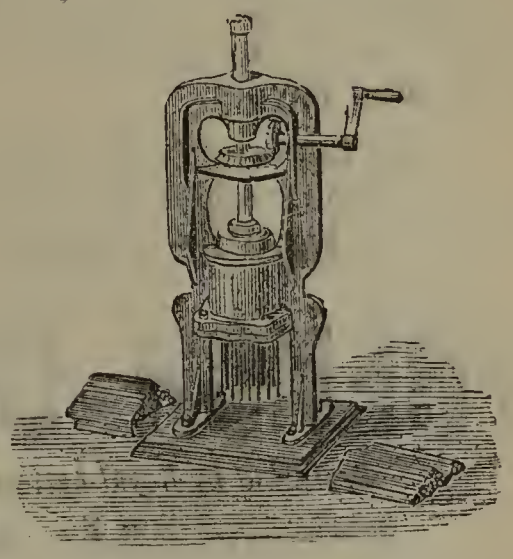

Fig. A.—This invention consists in a novel and improved arrangement of Machinery, whereby any description of Pill Mass can be converted into Pills, at the rate of from 15 lbs. to 40 lbs. per hour, according to the size of the Machine used.

Fig. C.—Is the improved Press for Piping, by means of which a great quantity of Mass can be Piped in a few minutes truer than by the old method of rolling.

ROTARY PILL MACHINES.	PIPING PRESSES.
Fig. A.—No. 1, **£12 12s.** 2, **£15 15s.** 3, **£20.**	No. 1, **£3.** 2, Fig. C., **£5 10s.** 3, **£8.**

Any of the above can be made to cut two or three different size Pills, at an additional cost for extra Rollers and Plates.

J. W. PINDAR'S improved double-action TINCTURE PRESSES, to hold 1 gallon, price **£3 10s.** £1 10s. extra for every additional gallon.

J. W. PINDAR'S PILL MASS KNEADER, price (with Gas Apparatus) **25s.** to **47s. 6d.**

Testimonials may be had on application to

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Wholesale Electricians' Sundriesmen,

LEICESTER.

Manufacturers of Electric Bells, Batteries, Coils, Medical Batteries, Magneto-Electric Machines, Electro Motors, Arc and Incandescent Lamps, Vacuum Tubes, &c., &c.

Electric Bells, from 39/ per dozen; Terminals, from 1/6 per dozen; Incandescent Lamps, from 15/ per dozen; Magneto Machines, from 10/; Bottle Batteries, from 2/9; Bell Battery, Push and Wire, from 7/6. Send for our New Illustrated Price Lists of Optical and Electrical Goods, Scientific Novelties, &c., Post Free on application.

Cheapest House in England for the above.

For indirect testimony to the success of Machine see an excellent letter on "Window Dressing" in the CHEMIST AND DRUGGIST *of January last.*

Orders from abroad attended to with dispatch. Remittance must accompany such. The Pill Machine placed F.O.B. for price quoted.

Sent by parcels post on receipt of 72 stamps.

T. S. COCKING'S PILL MAKING APPARATUS.

No. 1, double-action ROTARY PILL MACHINE, £8.
No. 2, CYLINDRICAL PIPER. 6/-.
No. 3, Brass PILL BURNISHER, 50/-. With Nos. 1 and 3 the equipment for Pill Making is complete for any quantity. With Nos. 2 and 3, worked with the ordinary hand pill machine, the requirements of the majority of chemists would be amply met.

Wholesale Agents—Maw, Son & Thompson, London.

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W. J. BUSH & CO.

DISTILLERS AND IMPORTERS OF

Essential Oils and Fruit Essences, &c.

SOLUBLE ESSENCES FOR AËRATED WATER,

DOUBLE THE STRENGTH OF ORDINARY SUPER QUALITIES.

W. J. B. & CO. caution the trade against the so-called soluble Essences now so frequently offered for sale, which are nothing more than mere tinctures, and, although offered at lower prices, cost five or six times as much in use, whilst imparting a strong medicated flavour.

The importance of our invention of Soluble Essence is clearly shown by the numerous imitators and copyers that have sprung up, and we must inform the Trade that ours are the only **Genuine Original Soluble Essences.**

FRENCH CREAM GUM EXTRACT.

Protected by Royal Letters Patent. For producing a head of creamy richness upon all kinds of

Syrups, Aërated Waters, Beers, Ales, Cider, &c.

W. J. BUSH & CO. regret having to caution the trade against spurious imitations of this article, most of which being mere rubbish.

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ENGLISH DRAWN ESSENTIAL OILS

OL. AMYGD. ESSENT. ANG.
" AMYGD. " (SINE ACID. PRUSSIC)
" ANETHI ANG.
" CARUI ANG.
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" CINNAM. VER. ANG.
" CUBEBÆ ANG.
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FOR THE MANUFACTURE OF THE HIGHEST CLASS OF

SODA, POTASS, SELTZER, CARRARA, LITHIA, MAGNESIA, AND TONIC WATERS, &c.

Prize Medals:
London, 1862, 1873, 1874;
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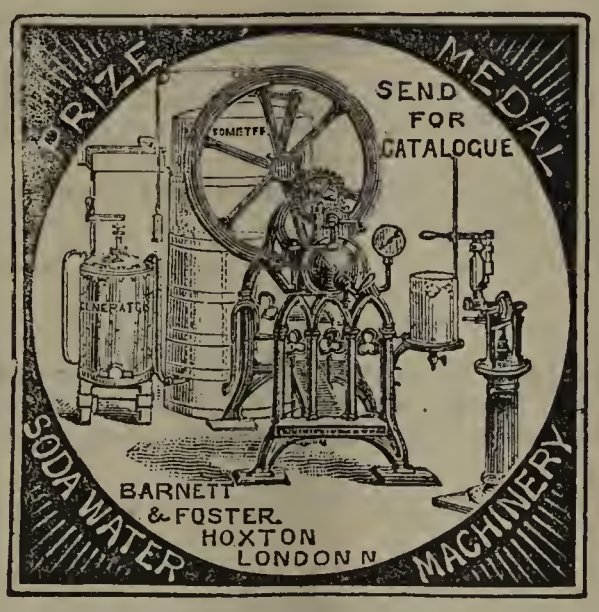

LEMONADE, GINGER BEER OR ALE, ORANGEADE, NECTAR, CHAMPAGNE CIDER, FRUIT CHAMPAGNE, &c.

Prize Medals:
Cape, 1877; Paris, 1867, 1878;
Highest Award, Sydney, 1879-80.

The Chemist who enters into the enterprise of manufacturing Aërated Drinks (with properly-constructed Machinery) in any districts where they are required, renders a real service to the public, and no business offers him a better return for a comparatively small outlay.

Our Machines are universally adopted throughout the world for the manufacture of all kinds of Aërated Drinks, whether in bottles, syphons, or counter fountains. There are in England alone over 2,000 factories where our Machinery is in use. They are the simplest, safest, and cheapest for the purpose, and produce a highly charged gaseous water free from metallic or foreign contamination.

All our Machines have a Gasometer, and it forms a most important necessity where purity of product is required, as in this the gas is expanded and purified; it also removes the possibility of accidents by explosion, and avoids the necessity of complication—these we consider of greater importance than the saving of a few inches of floor space.

No. 1,	to make	700	doz.	Botts.	per day	...	£70	0	0	*These are the same for any size Machine.*		
No. 2,	,,	500	,,	,,	,,	...	65	0	0	Bottling Apparatus for Corked Bottles ...	£9	9	0
No. 3,	,,	400	,,	,,	,,	...	60	0	0	,, ,, for Patent Bottles, with Syrup Pump ...	10	10	0
No. 4,	,,	300	,,	,,	,,	...	55	0	0	,, ,, with Syrup Pump for Champagne Bottles...	20	0	0
No. 5,	,,	200	,,	,,	,,	...	50	0	0	,, ,, with Syrup Pump for Syphon Bottles ...	14	14	0
No. 6,	,,	100	,,	,,	,,	...	30	0	0				

The above quantities are for Lemonade and other Saccharine Drinks; if for Splits, reckon double; if for a very highly charged Soda Water, reckon half.

These Machines are all packed without taking apart, and can be set to work immediately on arrival. Many of our Machines have been in constant use for forty years without requiring any repairs. Recipes and every information given for manufacturing all the above Drinks, so that the most inexperienced can at once produce Waters of the highest class. **Inventors of Fruit Champagne. Sample Case, containing 1 dozen, forwarded for 6s. 6d.**

OBSERVE!!—It is important that the Machines for the manufacture of Aërated Water should be of the very highest class, to produce the best results; and it is ill-timed economy to be tempted into buying cheap and worthless machinery, which is liable to get out of order soon, besides making very indifferent Waters. Purchasers must not overlook the fact that Soda Water Machines, like watches, can be made at any price.

THE "LONDON-MADE" SYPHON BOTTLE.

PRICES:

Quart size, 22s. per doz. } *by the*
Pint ,, 21s. ,, } *gross.*

No charge for packing if ordered in Bin Cases, 2s. 6d. each, holding 1 dozen.

The high reputation this bottle has achieved is due to the fact of its being in every particular the most perfect yet introduced, and when compared with others in the market it stands pre-eminent. It is the most simple in its working parts, therefore the least liable to get out of order; it is the most easily opened, the lightest pressure on the handle being sufficient; it produces a more highly charged gaseous water than is usually obtained from syphons; it compares most favourably in appearance with any, and the metal top being entirely free from lead, the prejudice against syphon drinks is at once removed, as the liquid passes over pure tin only.

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SOLE AGENTS FOR CODD'S PATENT BOTTLES—THE BEST FOR AËRATED WATERS.

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BINGLEY'S SUPERIOR GINGER ALE,

An Aromatic & Non-Intoxicating Stimulant,

Manufactured by a Special Process worked out by the Proprietor, by means of which the *aromatic* properties and *true* delicate flavour of *Jamaica* Ginger are fully retained. It is confidently offered as a very superior article.

The following are a few of the opinions which have been expressed in reference to

BINGLEY'S GINGER ALE.

"**The Chemist & Druggist**" of January 15, 1883, in an article on "GINGER ALE," says, speaking of the Ginger Ale manufactured by Mr. BINGLEY, of Northampton:—"We are bound to report most favourably. Very few makers have succeeded in so perfectly presenting the odour and aroma of Jamaica Ginger in a clear, bright, sparkling beverage."

"**The Midland Medical Miscellany**" of August, 1883, in a note referring to BINGLEY'S AERATED WATERS, says:—"We are particularly pleased with the Ginger Ale, which, as is not always the case, really presents the flavour of Ginger."

The following are a few of the opinions expressed by Chemists and others:—

"Excellent in every way."

"I like the Ginger Ale very much."

"We have tasted the Ginger Ale and like it very much; indeed, it is the best thing of its kind we have met with."

"We have received the case of Ginger Ale, and have tasted a bottle with one of . . . We think that your article has the advantage in point of delicacy of flavour."

"Having carefully tasted the Ginger Ale you were good enough to send me, and also submitted it to the judgment of a friend in the trade, I can speak of it advisedly in terms of high commendation. The aroma is very fine, and the full, generous warmth in the mouth is as near perfection as possible."

"I will write you about the Ginger Ale; it is first rate."

"The sample of Ginger Ale you were good enough to send me appears exceedingly good, and I shall be glad if you will send me one case at your convenience."

"Capital stuff is this Ginger Ale."

"Your Ginger Ale is excellent, and I shall be very glad if you will send me a case."

"Your sample of Ginger Ale is everything that can be desired. The fine flavour of the Ginger alone shows the care with which the essence has been prepared; it will certainly command a line in my next order."

"I have received the sample of Ginger Ale, and beg to state that it is the best I have ever tasted."

"I am pleased to say that so far the customers we have supplied with your Ginger Ale have been very pleased with the same."

"Your Ginger Ale is very delicious."

"The Ginger Ale arrived a week ago; I think it is very nice indeed."

"I certainly have not yet tasted anything to touch it."

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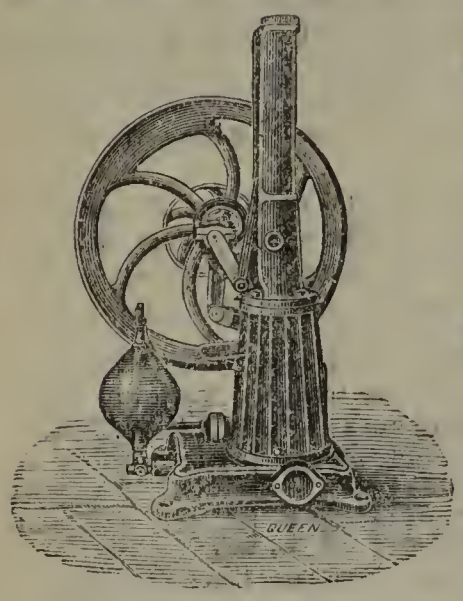

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Suitable for driving Light Machinery.

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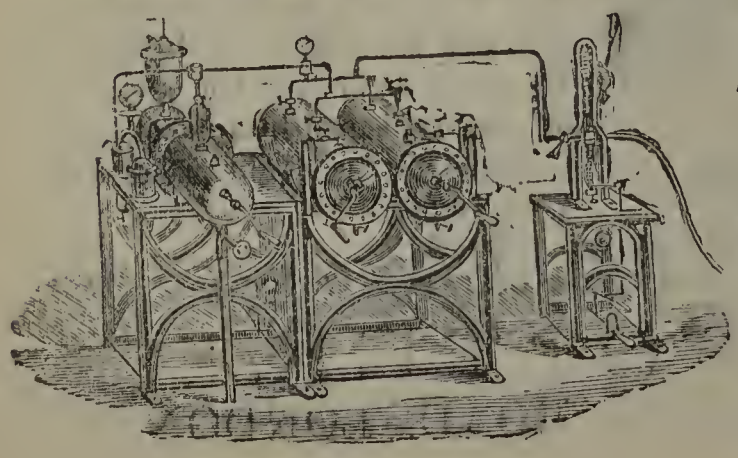

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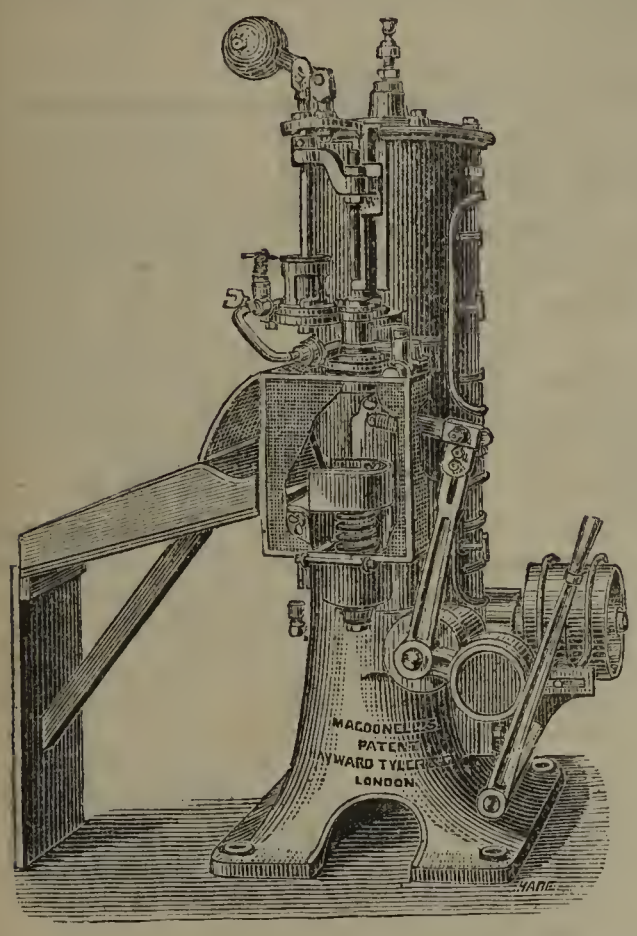

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BOTTLING, SYRUPING & CORKING MACHINES

For one, two, three, or six bottles at a time.

Will turn out with the aid of a girl or boy from 40 to 300 dozen per hour.

Strong and Durable Complete Plants equal for from 50 to 3,000 dozen of waters daily.

Machines made 40 years since are still giving satisfaction.

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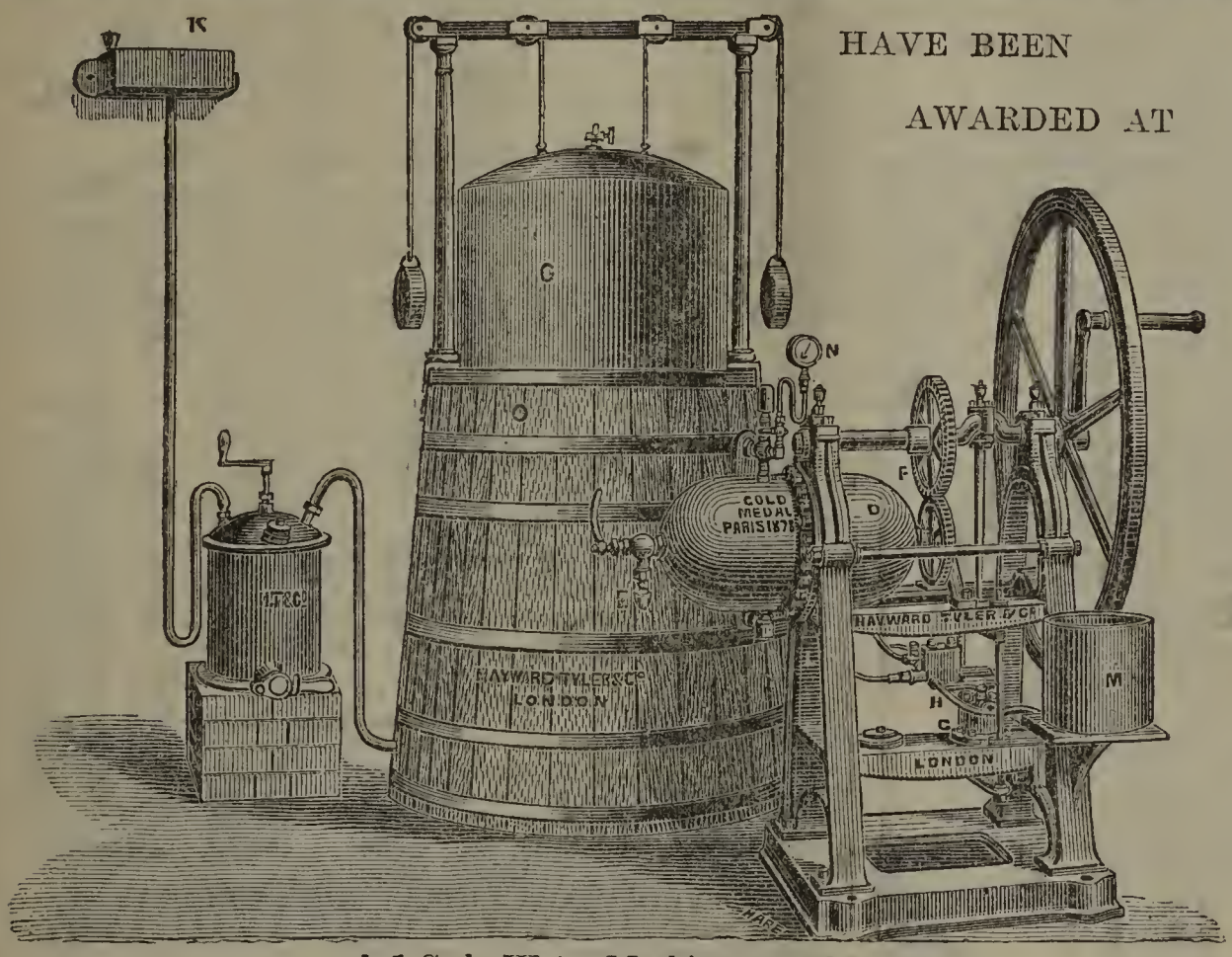

A 1 Soda Water Machine, complete.

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

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Also the **Artificial Mineral Waters** prepared by Dr. STRUVE and CO., at the Royal German Spa, Brighton; and R. ELLIS & SON, Ruthin.

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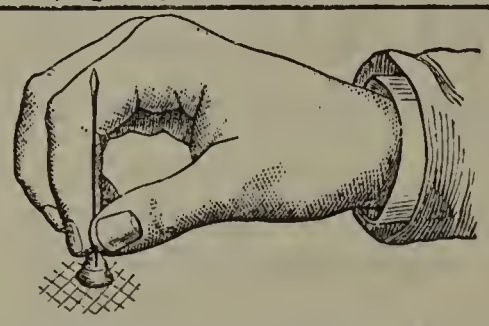

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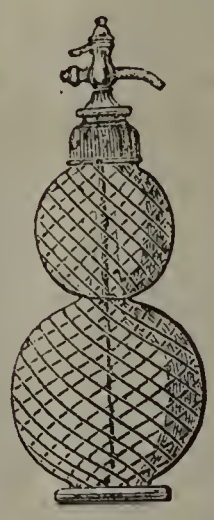

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3-pint size, strongly silver-plated, richly decorated Porcelain stands .. .. .. each 30s.
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	12 Charges	10 Charges
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Clear or coloured glass, viz., red, blue, green, or yellow, warranted pure ENGLISH BLOCK TIN TOPS, with piston or cap, 22s. 6d. *per dozen or £13 10s. for quantities of not less than one gross.* PACKING IN CASK 5S. PER GROSS.

The Name marked on the metals free of charge for quantities of not less than one gross. The Name engraved on the glass with Trade Mark, 1s. 6d. and 2s. per dozen extra.

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TRADE BRIGHTON Hooper's SELTZER MARK.

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BRIGHTON SELTZER

Per 2s. 6d. doz.

SIX DOZEN CARRIAGE FREE.

Special Terms for Quantity.

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Manufacturers and Importers of Mineral Waters,

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MINERAL WATERS.

FREDERICKSHALL (5 Cases, 6d. per Case less), 28/- Case, 30 bots.; 39/- Case, 60 ½-bots.
APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hprs. free. 5 °/₀ discount if 20. Carriage paid.
HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER	..	11/- Hpr.,	25 bots.
,,	..	15/- Hpr.,	50 ½-bots.
PULLNA	..	18/- Case,	20 bots.
,,	..	30/- Case,	50 ½-bots
VICHY	..	31/- ,,	50 bots.
,,	.. ..	27/- ,,	50 ½-bots.
CARLSBAD	..	37/- ,,	50 bots.
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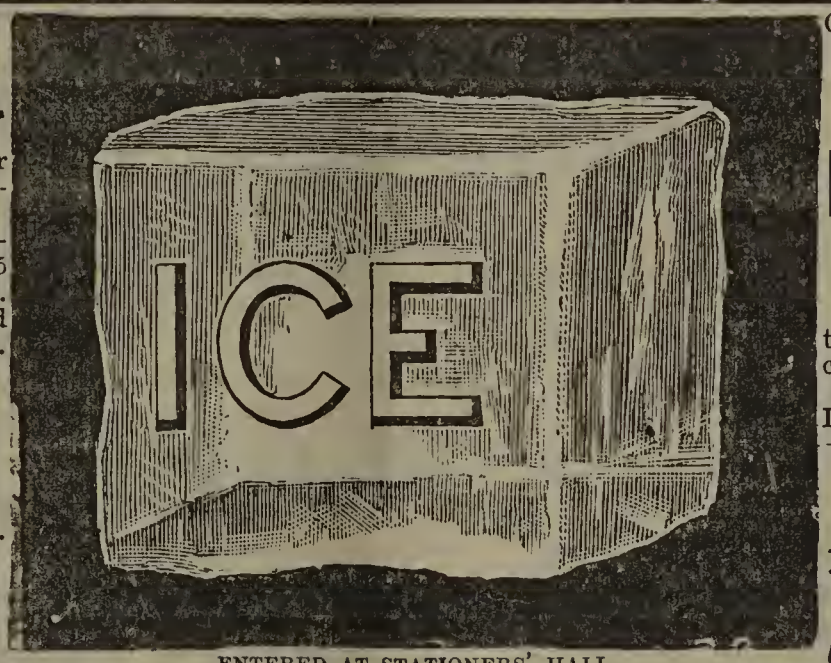
SCHWALLBACH		27/6 ,,	50 ,,
HOMBURG	..	40/- ,,	50 ,,
WILDUNGEN		43/- ,,	50 ,,



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CARLSBAD SALTS, ¼-bots., 20/- per doz.; ½-bots., 40/- per doz.; bots., 80/- per doz.

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Original Blocks, 2s. per Cwt.

Packing and Mats free.

Low quotations given for quantities taken from vessels while discharging.

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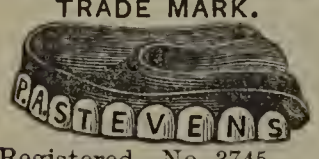

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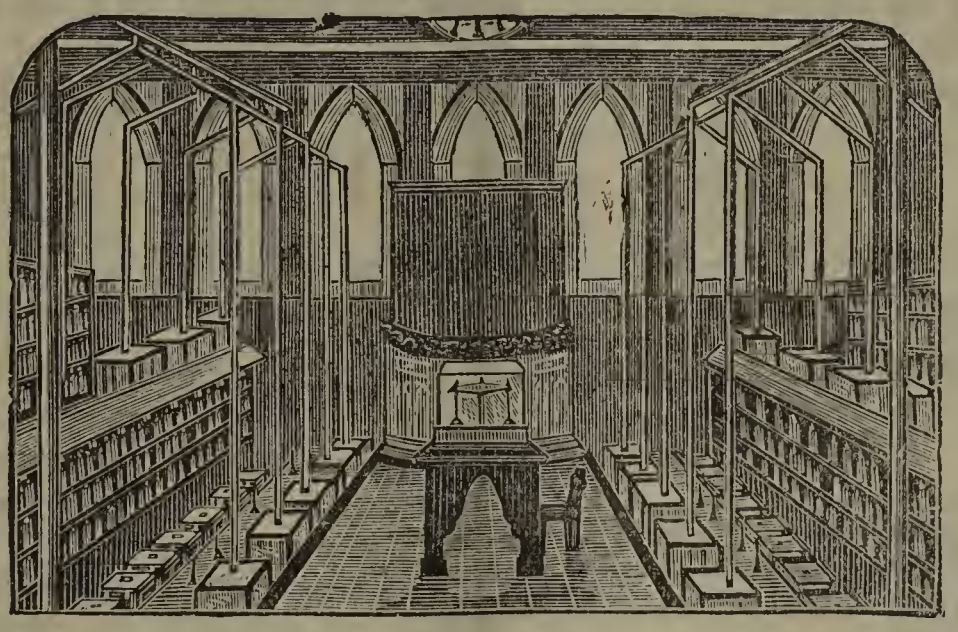

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H. E. S.

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Lucerne Cottage, Hurstpierpoint,
15*th July*, 1883.

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(December, 1883.)

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Owens College, Manchester.—

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The Pharmaceutical Laboratory and Materia Medica Museum will be open daily from 10 to 5 (except Saturday).

Courses of instruction in Materia Medica, Pharmacy, and Pharmaceutical Chemistry will be given by Prof. Leech and Mr. W. Elborne. The Summer Course of Lectures in Botany by Prof. Williamson will commence on May 1 and terminate in July.

Complete arrangements now exist for carrying on practical work in the laboratories.

For further particulars, apply to

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AS Temporary or Manager. Minor qualification. Age 29. Over three years in last situation. Good references. Disengaged. Particulars, &c., to J. T. Livesey, Station Rd., Kirkham, Lancashire.

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FRANCE.—Good Dispenser, with fair knowledge of French, desires a French situation, as Assistant. Age 22. Height 5ft. 6in. 5 years' experience. Frank Dale, 5, Cheap St., Bath.

JUNIOR Assistant, in good class business. Good references. Age 19½. Height 5ft. 9in. Disengaged. D. T., Lake St., Ferndale, Pontypridd.

AS Assistant, in New Zealand. Taranaki preferred, 2 years' experience. R. S. Sadler, New Plymouth. Taranaki, New Zealand.

AS Assistant or Dispenser, or to Manage a Branch business, by an elderly qualified person. Highest references and long experience. Can Extract Teeth. Chemicus, 55, Upper Parliament St., Nottingham.

AS Junior. Disengaged March 6th. Age 22. Height 5ft. 9in. Abstainer. Good references. In or out-door. Fieldhouse, 56, Southgate, Bath.

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AS Junior. In or near London, where two or more are kept. Age 21. Good references. Disengaged. W. R., 317, Hackney Rd., E.

AS Junior. Age 22 years. Height 5ft. 11in. 6 years' experience. Good references. In or out-door. T. Glover, 14, St. Julian's Rd., Kilburn, N.W.

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AS Assistant or Dispenser, in good business. Age 23. Height 6ft. 7 years' experience. Major qualification. H. C., 38, St. Paul's Rd., Bradford, Yorks.

AS Assistant, with view to purchase, or Partnership preferred. Age 25. Minor and Hall qualifications. In or near London preferred. Particulars to H. Whiffin, Hassett St., Bedford.

RE-ENGAGEMENT by competent qualified Assistant. 11 years' varied experience, last 4 in London (City). Speaking French and a little German. Conversant with postal duties. In or out-door. Age 27. Height 5ft. 8in. Highest references. Disengaged. Statim, 42, Oakley Cres., S.W.

BY thoroughly competent Assistant. Aged 30. Registered Dentist, &c. 12 years' experience. Highest references. Evening employment in W. or S.W. district would be entertained at present. X., 64, Solon Rd., Brixton.

ENGAGEMENTS WANTED.

TO Druggists' Sundrymen, Patent Medicine Dealers, Drysalters and General Merchants.—By advertiser, in above. Age 30. Good appearance. Thorough and experienced Counterman. Highest references. P. M., 75, Norton St., Grantham.

AS ASSISTANT. Temporary or permanent. Varied experience. Can Prescribe, Extract Teeth, &c. Abstainer. Good references. Age 30. AQUA, 23, Cardiff St., Rochdale Rd., Manchester.

DISPENSER. 8 years' experience in Dispensing and general Retail. Good reference. BETA, 60, Perth Rd., Finsbury Park, N.

AS JUNIOR, in light Retail and Dispensing business in London or suburbs. With time for study preferred. Age 20. Height 5ft. 8in. Good reference. Disengaged. TYLER, Walton, Ipswich.

AS ASSISTANT. Minor and Hall qualifications. Town and country experience. Can Extract Teeth. Height 5ft. 10½in. Age 25. T., 49, Penrose St., Walworth, S.E.

AS ASSISTANT, in a good London house. Age 24. Minor. First-class references and experience. R. B., 14, Grand Parade, St. Leonard's-on-Sea.

WHOLESALE.—As ASSISTANT. 9 years Retail, also little Wholesale. Town or country. T. S., 2, Highland Vale, Worrell Rd., Clifton, Bristol.

LOCUM TENENS AND TEMPORARY. London or country. Good connection. References, Testimonials, &c., from R. E. BUNN (of Woolwich and Ipswich), 9, Friar's Rd., Ipswich, Suffolk. Disengaged 24th inst.

AS Junior ASSISTANT. London. Disengaged. 4 years' experience, town and country. Height 5ft. 10in. Age 22 years. BETA, care of Jas. W. Saunders, Medical Tutor, Rochester Sq., N.W.

AS JUNIOR, in-door, with time for study. Age 22. 4 years' experience. Disengaged. E. E., 6, Bristol Garden, Maida Hill, W.

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A STEADY, qualified ASSISTANT, of business-like habits, and competent to take charge during absence of principal, for a business in Cardiff. Apply at once, with full particulars, to L. DAVIS, 30, Jackson St., Gateshead, Newcastle-on-Tyne.

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TWO IMPROVERS, for light Retail business. Ages 18 to 20. Must be steady, willing and obliging to customers. Address (if personal application, between the hours of 3 and 5 p.m.), stating particulars, salary expected, &c., to J. HOLLOWAY, Chemist, Wood Green, N.

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A MANAGER in a Chemical Laboratory. Must be able to conduct analyses of drugs and chemicals, thoroughly understand the working of a laboratory in all its branches. Will be required to manufacture personally some of the finer chemicals. Apply, at first, by letter only, stating age, salary, and qualifications, to CHEMIST, care of Messrs. Dawson and Sons, 121, Cannon St., City, E.C.

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A JUNIOR or TURNOVER, about March 7th, for one month, in light country business. Apply, with particulars, salary required, reference, and carte if convenient, to JOHN GIBBS, Chemist, Upton-on-Severn, Worcestershire.

AN IMPROVER for a Mixed business. Will have to keep the books. Send usual particulars, with carte, to be returned, to JOHN W. DENNIS, Chemist, Louth, Lincs.

IN a London suburb (S.E.), an ASSISTANT, about 22, accustomed to Dispensing, Prescribing and light Retail. Must have been accustomed to, or willing to assist occasionally in postal duties. Apply, with full particulars, stating salary required, to S. B., care of Messrs. Barron & Harveys, Giltspur St., E.C.

AN ASSISTANT, about 21 years of age, for a Retail business. Apply, stating salary, &c., to H. R. ADAMS, Chemist, Whitstable.

ASSISTANT, not under 25. One accustomed to Dentistry preferred. A share of profits given. Apply to E. MARSHALL, East Molesey, Hampton Court.

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OLD-established, sound, profitable BUSINESS (Agricultural, Prescribing, and general Retail), in South of England. Everything at full prices. Convenient house, at low rental, in one of the leading thoroughfares. Satisfactory reasons for disposal. Full particulars on application to ALPHA, care of Messrs. Barron, Harveys & Co., Giltspur St., London.

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A GENUINE old-established first-class Family Retail and Dispensing BUSINESS, situated in large manufacturing town in Lancashire. Returns over £1200. Large handsome shop. Well assorted stock. Good house. Cause of disposal, family reasons and ill-health. Valuation or private arrangement. Thorough investigation and introduction. Address, P. C., care of Messrs. Barron, Harveys & Co., Giltspur St., London.

CITY and suburbs.—A gentleman, going abroad, is desirous to dispose of his two BUSINESSES. The city business returned in 1883 nearly £700, and the suburban business, £500. They are within easy access of each other. Both pharmacies are thoroughly well-fitted and stocked. The suburban business has a first-class residence. Price for the two, £1100; or they will be disposed of separately if desired. Apply, TAYLOR & Co., 38, Walbrook, E.C.

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A BUSINESS requiring the investment of £600 to £800, in the country (sea coast preferred), or one of less value, if capable of increase, would be entertained. No agents. Address, with fullest particulars, in confidence, CHEMICUS, 60, Camberwell Rd., London, S.E.

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BEST plate glass Counter Cases, as fig. A 16, 2ft. 6in., 3ft., 3ft. 6in., 4ft., 5ft., 6ft., 6ft. 6in.; as fig. A 1, 5ft. long, £9; 3ft. 6in., as fig. A 4, £7; as fig. A 6, 5ft., £5; fig. A 7, 6ft. long, £6; as fig. A 9, 35s.; as fig. A 10, 50s.; large size, 60s.; 4ft., as fig. A 17, 80s.; 4ft. 6in., A 17, 85s.; 10ft., as A 15, £10; Desk and Case, plate glass, fig. 31; Show Steps, A 37, 70s.; A 38, 30s.; A 40, 45s.; Soda Water Stand, 45s., A 57; all the above cases are plate glass. E. NATALI, 207, Old Street, E.C.

A 6 FT. plate glass Dispensing Screen, fig. A 55, very handsome figured mahogany, silvered glass back inside case, and fitted with glass (shifting) shelves, with polished edges, tablet on top; a 4ft. do. do., as fig. A 54. E. NATALI, 207, Old Street, near Pitfield Street, E.C.

A ROTARY Pill Machine and Piping Press; 6 doz. 1-gall. white glass Tincture Bottles; 6 doz. 80-oz. ditto; Specie Jars, Ointment Jars, Fancy Jars, Brass Pillar Scales, fig. 1, 20s.; Pill Machines (to cut 24), 3, 4, or 5-grain, 16s.; 5-grain ditto, marble slab, 18/6; a number mahogany nests Drawers, glass labels and knobs, at 2/6 per drawer, 10 drawers to every 2ft.; 12ft. Spanish mahogany Counter, fitted with drawers; a 14ft. mahogany Counter, fitted with glass cases in front and drawers under; 12ft. mahogany top, grained front, fitted with drawers; 7ft. and 10ft. mahogany top Cupboards; a 6ft. mahogany top Counter, fitted with glass cases in front and drawers under; a quantity of mahogany fronted Shelving, Cornice, Pilasters, Lockers. E. NATALI, 207, Old Street, near Pitfield Street, E.C.

A NUMBER of Mortars and Pestles; 5ft., 6ft., 7ft. splendid mahogany Dispensing Screens, glass case at each side, silvered plate glass centre, with marble slab in front, shelves at back for Dispensing bottles, with handsome tablets on top, £7 10s. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

A HANDSOME plate glass and mahogany Counter Case, with upright case on top, as fig. A 4, £7, 3ft. 6in. long; a 5ft. plate glass Counter Case, revolving front glasses, fig. A 1, £9; a 8ft., as fig. A 18, £8; 6ft., A 18, £6; 5ft., as A 18, £5; splendid mahogany and plate glass Wall Case, A 88, 8ft. long, £28; Sponge Cases, as A 41, 60s.; A 43, 90s.; Desk and Glass Case, fig. 31, plate glass, 60s. E. NATALI, 207, Old Street, near Pitfield Street, E.C.

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A SECOND-HAND mahogany plate-glass Tooth Brush Case, £1 10s.; one 6ft. Spanish mahogany Dispensing Screen, with 3 plate-glass doors and plate-glass tablet on top, as fig. A 55, £6 5s.; a 5ft. mahogany circular fronted plate-glass Counter Case, with sloping shelves at the back and tables in the centre, as A 18, £5; 6ft. long, £5 15s.; 7ft. long, £6 10s. J. BYGRAVE, 12, Curzon St., Wenlock St., New North Rd., Hoxton, London, N.

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2. LONDON, S.E.—Dispensing, Prescribing and light RETAIL. Returns £370. Price £270. Post office attached brings in about £26 per annum. Rent £40.
3. YORKSHIRE.—Profitable concern, with Gilbey's Agency. Returns £900. Price £400. Rent only £26 a year.
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5. NORTHAMPTONSHIRE.—Dispensing, light Retail and PRESCRIBING (a small amount done in paints and oils). Established over 50 years. Average returns between £600 and £700. Price about £600. Rent £60.
6. LONDON, S.E.—Good class Retail, Dispensing and PRESCRIBING. Returns £420; gross profits about £250. Rent £48. Price £420.
7. SOMERSET.—Good Family, Dispensing, Retail and Stationery BUSINESS. Returns over £1260, at excellent profits. Price £1100. Rent only £52 per annum.
8. LONDON (CITY).—An improving Retail, Dispensing and Prescribing BUSINESS, with several good Proprietary Articles. Returning at the rate of £900 per annum. Price £750.
9. LONDON, N.—Family Retail, Dispensing and PRESCRIBING. Shop handsomely fitted and well stocked. Good house. Returns £500. Price £400.
10. HANTS.—An improving light Retail and PRESCRIBING. Recently established. Returns £300 last year. Price £250.
11. GLOUCESTERSHIRE.—A neglected light Retail, Prescribing and Dispensing BUSINESS. Returns £4 a week, which could easily be doubled in a few months. Price £300.
12. CHESHIRE.—Retail, Dispensing and PRESCRIBING, with several valuable Proprietary Articles. Very large, handsome shop. Returns about £360. Price, valuation.
13. SOUTH COAST.—In a rapidly increasing high class neighbourhood. First-class Dispensing and Prescribing BUSINESS. Returns between £600 and £700, and increasing. Shop very handsomely fitted and well stocked. An exceptionally good house, held on lease. Price about £700.
14. LONDON, N.—Ready money Retail, Dispensing and PRESCRIBING, with some Proprietary Articles. Returns £250. Price about £250. Open to a reasonable offer.
15. YORKSHIRE.—Middle-class Prescribing and RETAIL. Returns about £300. Price about £250.
16. LONDON, S.W.—Ready money Retail and PRESCRIBING. Returns about £350. Price about £300. Death cause of sale.
17. LONDON, W.—Select Dispensing and Family RETAIL. Returns about £9 a week, by manager. Price £350.
18. S. WALES.—Retail, Dispensing, Prescribing and Agricultural trade and light GROCERY. Returns £950. Price £300. Proprietor going abroad.
19. LONDON, N.W.—Dispensing, Prescribing and general RETAIL, with Dentistry. Returns about £700. Price £100 goodwill and valuation.
20. LONDON, S.E.—Retail, Dispensing and PRESCRIBING. Returns £400. Price £350.
21. NEAR LONDON.—First-class Dispensing and light RETAIL. Established about 20 years. Returns about £1100, and improving. Very convenient house and handsomely fitted Pharmacy. Price £1250.
22. LONDON, N.—Prescribing, Dispensing and RETAIL. Price £250.
23. S. COAST.—Handsomely fitted lock-up PHARMACY, doing a rapidly improving high class Dispensing business. Rent £60. Price about £700.
24. LONDON, N.—Very profitable Prescribing BUSINESS, with Dental Surgery. Returns over £800. Price £900, or half share £450.
25. LONDON, S.W.—Returns £320. Price about £120.
26. YORKSHIRE.—Average returns £1000. Price £500.
27. NOTTINGHAM.—Returns £7 a week. Price £325.
28. WILTS.—Light Retail and DISPENSING. Returns £350. Price £310.
29. HANTS.—Light Retail and DISPENSING. Returns £300. Price £320.
30. LONDON, E.—Returns over £600. Price £600.
31. ESSEX.—Returns £500. Price £500.
32. WORCESTERSHIRE.—Returns £800 to £900. Price £890.
33. SOMERSET.—Returns £400. Price £340.
34. W. OF ENGLAND.—Wholesale and Retail Drug, Oil and Colour BUSINESS. Returns between £5000 and £6000. Price, valuation; no goodwill.
35. SURREY.—Returns £15 a week. Price £775.
36. BIRMINGHAM.—Returns about £500. Price £300.
37. LONDON, S.W.—Returns about £650. Price £575.
38. LIVERPOOL.—Returns about £500. Price, valuation of stock and fixtures.
39. YORKSHIRE.—Returns £2000. Price £1750.
40. KENT.—Returns about £800. Price £660.
41. SHROPSHIRE.—Returns £500. Price £285.
42. KENT (Seaside).—Returns, in season, £30 a week. Price £650.
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MIDLANDS.—Old-established RETAIL, with Agricultural and Mineral Waters, in important and good class town returns, Drugs £1450, Mineral Waters £850, shop is very large and handsomely fitted, there is an unusual chance of developing large Mineral Water trade, as business has been under management for years, price £1450, part can remain on security.

LANC.—Family Retail, Prescribing and DISPENSING, established 100 years, returns £1300, vendor emigrating, at valuation, about £900.

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N.—Main road. Increasing locality. Returns now £475. For £320. Well fitted.

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2. LONDON, W.C.—Close to Holborn Bars. Retail and DISPENSING. Returns at present about £530. Can easily be doubled by personal attention. Situate close to one of the largest hotels. Price about £400.
3. LONDON, N.—Main road, close to a large railway junction. Very old established good class Dispensing and RETAIL. Returns about £650. All full prices. Large house and good lease. Price about £600.
4. EASTERN COUNTIES.—Vendor retiring. Mixed BUSINESS. Returns over £3000. Held by the same family nearly a century. A good introduction will be given. No premium for goodwill. Stock and fixtures at valuation. To a gentleman prepared to invest about £600 cash, a good opportunity offers.
5. STAFFS.—Unopposed country BUSINESS, of good class. Retail and Dispensing. Returns £750. Large double-fronted shop, coach-house, stables, and garden. Price about £700.
6. SOUTH COAST.—Vendor retiring. Old established Retail, Dispensing and PRESCRIBING. Returns £500, with very large profits. The vendor is anxious for an immediate sale, and will accept £100 if purchased at once.
7. Within easy distance of BATH.—Dispensing and Retail and good Family BUSINESS, with some Stationery and Printing attached. Easily worked. Returns £1300. Net profit £400. Several agencies attached. Price about £1100, or valuation. Terms can be arranged.

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VALUATIONS.

Terms for valuation on application.

Appointments for March should be made as early as possible.

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"A SEVERE TEST."

From G. T. COURTENAY, Esq., L.R.C.P., Birkenhead, January 8th, 1880.

"I have great pleasure in testifying to the great satisfaction your Coated Pills have given me. The Pills I enclose to you were some I got from you about three years ago, and since then they have gone through a severe test, having made four Voyages to South America, three being to the West Coast and two to the West Indian Islands. They were kept in a tin box, anything but air-tight, and had no protection from damp. The Coating could not be in better condition, and having used some lately, I find their efficacy quite unimpaired."

"ANOTHER SEVERE TEST."

From Dr. JOSIAH WILLIAMS, Sheffield, June 22nd, 1882.

"I have just returned to Sheffield after six months' travel through Italy, Egypt, Central Africa, and Abyssinia, and knowing that you have a large trading connection abroad, I am induced to send you the following particulars of the excellence of your Pearl Coated Pills.

"I took with me over 30 gross of various Formulæ of your Coated Pills, and they were subjected to the following severe tests of temperature :—We were three weeks in crossing the Desert from Suakin to Kassala ; the first day was a journey of the most unpleasant nature, through torrents of rain : this found its way into the Medicine Chest, making the straw in which the medicines were packed very damp ; after this the heat was very excessive every day (Solar Thermometer 150° Fah.), causing the interior of the chest to be quite hot and steamy for a day or two. In passing through the Kunama Country up to Abyssinia, the temperature at mid-day was 100° Fah. in the shade, sinking by 10 p.m. to 37°. Later on whilst among the Hamram Arabs, we had the temp. as high as 106° in the shade; but notwithstanding this immense variation in the temperature, I found your Coated Pills perfect in every particular, not one of them cracked or discoloured.

"It affords me the greatest possible pleasure to communicate the above testimony, and beg of you to make any use you may deem desirable of my experience."

"A THIRD SEVERE TEST."

From W. E. GREENE, Esq., M.R.C.S., &c., Sandown, I.W., September 15th, 1882.

"Enclosed you will find a specimen of your Lead and Opium Pills, some of a quantity purchased from you about eight years since, and which, with others in an equally good condition, have lately been returned upon my hands. You will find the coating as perfect as upon the day they were bought. At that time I was living in a damp locality near the Sea, in South Wales, and during the whole period they have been kept in an open, wide mouth bottle, freely exposed to the atmosphere.

"In the same box you will find some Lead and Opium Pills received from another firm less than two years ago; these were kept in a dry room in a chip box, but became moist and spotted in a few months. The present condition you can yourself judge of."

"A FOURTH SEVERE TEST."

From the Rev. JAMES MARTIN, M.A., M.D., M.Ch., Antioch, Syria, April 10th, 1883.

"Will you be good enough to send me, as soon as possible, the enclosed order for Drugs and your Pearl Coated Pills. I have great pleasure in stating that the Coated Pills I have received from you for many years have given me the greatest satisfaction. They are elegant and most convenient for dispensing, and I must also add, keep most perfectly in this trying and variable climate. Thanking you most kindly for your prompt attention, and the great care exercised in the execution of my orders."

"A FIFTH SEVERE TEST."

From J. D. McCARTHY, Esq., M.D., M.Ch., 1st Prizeman and Scholar Queen's Univ., Ireland.

Lagos, West Africa, Sept. 16, 1883.

"I shall be glad if you will send me per early steamer the enclosed order. I am glad to be able to tell you that your Pearl Coated Pills keep splendidly, and are as perfect as the day I brought them from England. If humidity could have affected them, the past rainy season would have done the work, for we have had a tremendous fall. After this experience I shall not be afraid of any test."

Now ready, the Ninth Edition of our Price List, containing nearly 700 Formulæ, with a Therapeutical Index by Dr. A. Wallace. Post Free on application.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 714.] SATURDAY, MARCH 1, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

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ELECTION OF COUNCIL AND AUDITORS.

EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, March 5th.

The Chair will be taken at half-past Eight *precisely*.

The following papers will be read:

"Note on Logwood as a Test for Metals."

By ARTHUR WEDDELL.

"On the Chemical Composition and Properties of a Crystalline Principle obtained from Jambosa Root."

By A. W. GERRARD.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 11 a.m., on the second Tuesday in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

* A Certificate of having passed any of the Examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

The Certificate must be forwarded to the Registrar, with the fee of Two Guineas, for the approval of the Board of Examiners, and must be so approved before the Candidate is eligible to enter his name for the Minor Examination.

THE ANNUAL DINNER

of the Members of the Pharmaceutical Society and their friends.

A Meeting will be held at 17, Bloomsbury Square, on Wednesday, March 12th, at 12 noon, for the purpose of making preliminary arrangements for the Annual Dinner. The President in the Chair. Gentlemen interested in this annual gathering are invited to attend.

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OF THE

Pharmaceutical Society of Great Britain.

LECTURES.

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FEES.	£	s.	d.
One Course (five months)	3	3	0
An entire Session (two Courses)	4	4	0
Perpetual admission	5	5	0

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On Thursday, Friday, and Saturday Mornings, at 9 o'clock.

FEES.	£	s.	d.
Botany and Materia Medica, one Course (five months)	2	2	0
An entire Session (two Courses) including Systematic and Practical Botany	3	3	0
Systematic and Practical Botany, separately	1	1	0
Perpetual admission to all the Courses	4	4	0

The First Course, extending from October to the end of February, comprises Botany and Materia Medica, with especial reference to Structural Botany and the use of the Microscope. The Second Course, which commences in March and extends to the end of July, comprises Botany and Materia Medica, with especial reference to Systematic and Practical Botany.

The term of study may, if necessary, extend from any period in one Session to the next.

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Demonstrator—Mr. WYNDHAM R. DUNSTAN.

Assistant Demonstrator—Mr. F. W. SHORT.

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	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
10.0 to 5.0 daily (Sat. 10.0 to 2.0)	4 4 0	7 7 0	10 10 0	15 15 0	26 5 0
Three days weekly or 3 hours daily	2 17 6	4 17 6	6 16 6	10 10 0	17 17 0
Two days weekly or 2 hours daily	2 2 0	3 10 0	4 17 6	7 7 0	12 12 0

The Laboratories are open from ten o'clock in the morning until five in the afternoon daily, except on Saturdays, when they are closed at two o'clock.

An independent course of study of any length can be commenced on any date. The term of a pupil may extend, if necessary, from one Session into another.

Application for admission to the School, for Prospectuses, or for further information, may be made to the Professors or to their Assistants in the Lecture Theatre, or Laboratories, 17, Bloomsbury Square, London, W.C.

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See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

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"A mixed purgative, with well-marked antacid reactions . . . . . .
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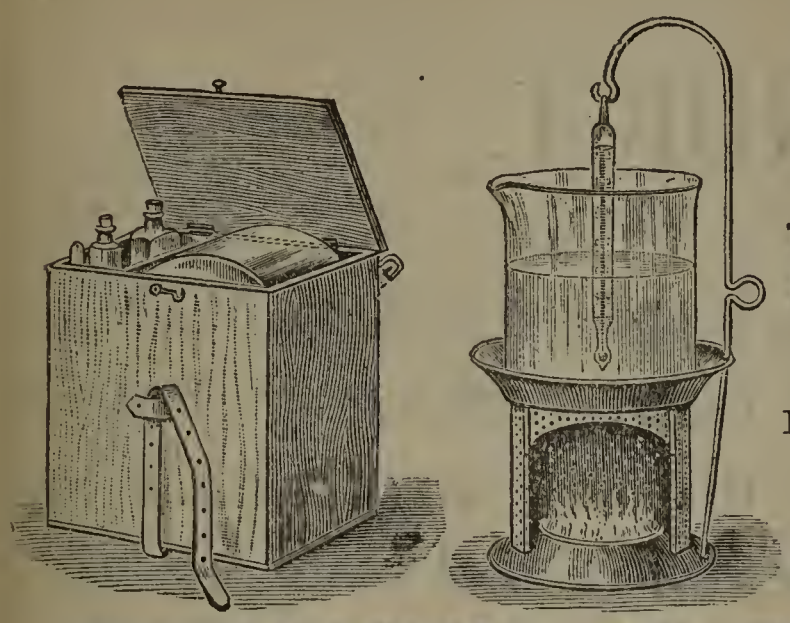

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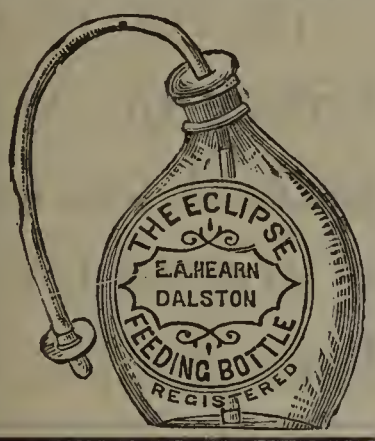

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THE LANCET reports of the Kepler Extract of Malt: "*The best known*, and *in this country the largest used Extract of Malt.* It is as distinct an advance in therapeutics as was the introduction of cod liver oil.

Professor Yandall, M.D., of Louisville, U.S.A., reports of it:—"The Kepler Extract of Malt is the best, and has the finest flavour of any I have seen; it is a very valuable preparation."

"The Medical Times and Gazette" says of it:—"The Kepler Extract of Malt is deserving special commendation. It is, we venture to say, by far the best we have seen. *The one most widely known and most largely used in this country.*"

"The Medical Press and Circular" in reporting upon the subject says:—"The Kepler Extract of Malt is reliable, and is manufactured in such a careful manner as to ensure the preservation of its valuable constituents. It is very delicious to the taste, and has been found by analysis to be exceedingly rich in diastase, and consequently is a valuable digestive agent.

"The Kepler Malt, combined with Cod Liver Oil, is the most palatable and easily digested of any form we have yet seen for administering Cod Liver Oil."

Burroughs, Wellcome & Co., Manufacturing Chemists, Snow Hill Buildings, London, E.C.

THE COMPOSITION OF POTASSÆ SULPHAS CUM SULPHURE.*

BY T. MABEN AND M. DECHAN.

Having found in the course of business that the potassæ sulphas cum sulphure of commerce varied considerably in character, our attention was directed to the preparation of the substance, and it subsequently occurred to us to ascertain its composition and, if possible, the causes of the variations therein. This very old remedy was at one time held in high estimation, but of late years it has fallen into disuse, save in its connection with the preparation of artificial Harrogate salts. So far as we know, its composition has never been systematically investigated, which is, however, hardly to be wondered at, seeing that the substance has only a limited application.

The directions for the preparation of pot. sulph. c. sulph. are as follows:—"Take equal parts of nitrate of potass and of sulphur and mix them thoroughly. Throw the mixture in small successive portions into a red hot crucible and when the deflagration is over and the salt has cooled, reduce it to powder and preserve it in well-closed bottles."† When prepared strictly in accordance with these directions, the salt obtained varies very little in composition, provided small quantities only are operated with; with large quantities considerable variation may be expected.

The colour of the substance ranges from yellowish-white to grey. The more yellow powder is obtained when the preparation is conducted throughout at a red heat, the colour varying slightly with the temperature. If a glazed crucible is employed and care taken in the preparation, the salt should always be more or less of a yellow colour.

Very different opinions have been expressed regarding its composition, but this is not at all surprising; considering the difficulty of obtaining specimens of the salt identical in every respect, it would be a matter for surprise had it been otherwise. One author states that the popular idea that it contains sulphate of potass with a little sulphur is, so far, incorrect; another, that it is composed of "sulphate mixed probably with some sulphite;" while a third thinks that in the reaction that takes place "sulphuret with sulphite, hyposulphite or sulphate are probably formed." Christison found that "sulphuretted hydrogen is not disengaged on a strong acid being added," while the late Mr. John Mackay‡ states that this gas was given off on the addition of water. Mr. Mackay's opinion was that the substance consists of sulphate and sulphuret of potash and free sulphur in the respective proportions of 55, 35 and 10.

It is more than probable, in consideration of these conflicting opinions, that the authorities cited have been describing, under the same name, salts in some respects quite distinct from each other, and our own experience strongly supports this conjecture.

We have met with specimens of the salt that did not give off appreciable quantities of sulphuretted hydrogen on the addition of a strong acid, while other specimens evolved an abundant supply of that offensive gas on being mixed with cream of tartar and water.

The cause of this variation is, as already stated, the degree of heat employed. Thus, we found that if the crucible is brought to a dull red heat before commencing operations, and this temperature maintained throughout, the percentage of sulphide is reduced to a minimum. If, on the other hand, the mixed powders are thrown into the crucible before red heat is attained, even though deflagration takes place, or if the heat is withdrawn before the operation is complete, the proportion of sulphide is certain to be higher than in the former case. If prepared in small quantities there is no difficulty in having a compound practically free from sulphide, as the necessary temperature for this end can be well kept up, but with large quantities this is not possible.

It is quite easy, therefore, to account for the different results obtained by Christison and Mackay. The former would doubtless prepare only a small quantity, and that at a red heat according to the directions, while the latter operated with large quantities, and he expressly states that he began to throw in the mixture before red heat was attained, one of his reasons for so doing being that the loss was greater at the higher temperature. We have verified this statement, having found that from 40 to 45 per cent. of finished product can be obtained according to the temperature employed.

We have analysed the seven samples which are on the table, the detailed results being as follows:—

	1	2	3	4		6	7
Potassic sulphate . .	95·9	92·5	97·75	96·5	97·0	96·0	97·5
Potassic sulphide . .	0·6	1·2	0·4	0·1	0·7	0·8	0·6
Free sulphur	1·0	0·4	0·5	0·5	0·4	0·5	Trace
Insoluble matter . .	0·5	4·1	0·5	1·5	0·6	0·5	0·25
Moisture and loss . .	2·0	1·8	0·85	1·4	1·3	2·2	1·65
	100·0	100·0	100·00	100·0	100·0	100·0	100·00

Nos. 1, 2, 3 and 6 were bought in the usual course of business; Nos. 4, 5 and 7 were prepared by ourselves. No. 4 was prepared in very small quantity and at red heat; No. 7 was also prepared at red heat, but in larger quantity, and No. 5 was prepared at the lowest temperature at which deflagration took place. No. 2 contains a trace of sulphite from which the others are free. None of the samples contain hyposulphite. The insoluble matter in No. 2 was chiefly iron; the salt had evidently been prepared in an iron crucible. No. 4 was prepared in a Hessian crucible, which may account for the larger proportion of insoluble matter in it than in Nos. 5 and 7.

The sulphate was estimated with barium in the usual way. The sulphide, being present in rather small quantities for weighing, was estimated by means of sodic nitroprusside, the colour reaction of which is exceedingly delicate, though, without special precautions being taken, it is difficult to obtain reliable results by means of this reagent. The sulphide was present as one of the polysulphides, probably the pentasulphide. Owing to the intense heat required in the preparation, it is almost impossible for hyposulphite to be formed, while with the nitric acid as an additional oxidizer, the presence of sulphite other than as traces can hardly be expected.

It will be noticed that while all the samples contain sulphide, No. 2 alone can be said to have more than a trace. It is perfectly possible, however, that the salt may be prepared under such conditions that it will contain a larger percentage of the sulphide should such be desired. So far as we can judge all the samples on the table have been carefully pre-

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, February 20, 1884.

† 'Edin. Pharm.,' 1841.

‡ *Pharm. Journ.*, [1], i., p. 319.

pared according to the directions already quoted, but we have met with those regarding which this could not be said.

The question now arises, ought pot. sulph. c. sulph. to contain sulphide or not when used to make Harrogate salts? It is well known that this preparation has very little relation to the Harrogate mineral water, and, but for the sulphurous odour, would bear no resemblance whatever to it. As, however, Harrogate salts is a standard article, and in very great request as a family remedy, it is of importance that its composition should be as uniform as possible. Some might argue that since Harrogate water gives off sulphuretted hydrogen, so also ought a solution of Harrogate salts; while others might very fairly hold that the artificial compound has no relation to, and whatever may have been the original idea, it ought not now to be regarded as a substitute for, Harrogate water.

If the general opinion of the trade was in favour of a compound containing no sulphide the wholesale houses would soon satisfy the demand, and *vice versâ*. At present each maker will doubtless have his own standard, and unless the substance be always got from the same source its character is sure to vary. Indeed, as we have pointed out, variation may even occur to a considerable extent in different samples supplied by the same house. It is with the view of directing attention to this, the effects of which had frequently given us annoyance before we recognized its cause, that we have placed on record the results of our investigation.

PIPITZAHOIC ACID OR VEGETABLE GOLD.

BY THOMAS GREENISH, F.C.S.

At the annual general meeting of the German Apotheker Verein, which took place last autumn (1883), in Wiesbaden, there was exhibited by Herr Vigener, of Bieberich, a sample of a Mexican drug, rad. pereziæ, called by the natives "raiz del pipitzahuac." This root, but little known in Europe, has long been medicinally employed in Mexico, where it is much esteemed by the natives as an agreeable and energetic purgative. Prepared with brandy, it is considered by them a universal remedy for all diseases, including cholera. It is chiefly found in North Mexico in the valley of Tenancingo in the province of Toluca. Together with the root there were shown some samples of pipitzahoic acid which had been extracted from it in a more or less impure condition, varying with the solvents used—one specimen being in fine flakes, the result of subsequent sublimation, and of a brilliant golden yellow colour, hence the name "vegetable gold" applied to this product of the root.

The first notice of this drug in European scientific literature is in 1855, when Dr. Schaffner, a young German pharmacist, obtained of Dr. Leopold Rio de la Loxa, Professor of Chemistry and Pharmacy in Mexico, a sample of the pipitzahoic acid isolated first by him in a crude state by the dry distillation of the root, and also a second specimen of the acid, one of greater purity, the result of extraction with alcohol and subsequent crystallization.

A small quantity of this acid was forwarded to Professor Liebig for analysis, and he handed it over to his assistant, Weld. A notice of this analysis will be found in the *Annalen der Chemie und Pharmacie*, 1855. The sample was found to be soluble in spirit, but not completely soluble in absolute alcohol or ether, and almost insoluble in water; but as the pure acid is soluble in absolute alcohol and ether, Weld concluded that the sample was contaminated with some foreign resinous substance. On the evaporation of the alcoholic solution the pipitzahoic acid crystallized in leafy tufts and from the ethereal solution in small shining oblique-rhombic tabular crystals. The acid, of a golden colour, remains unaltered in the air; it is almost insoluble in water, easily soluble in alcohol and in ether, from which it is precipitated by water in a voluminous yellow mass. It melts at 100° C. to a red fluid which on cooling assumes a crystalline form. At a temperature only a little above 100° C. it volatilizes without decomposition and condenses in golden yellow leaves. The small quantity of acid at the disposal of Weld did not allow of his making further experiments, but the chemical formula he gives as $C_{30}H_{20}O_6$.

From 1855 to 1876 the literature of chemistry, pharmacy or medicine makes no mention of this substance, but Mr. J. R. Jackson, in his report on the Chemical and Pharmaceutical Products in the Philadelphia Exhibition, 1876, referring to the Mexican exhibits says, "Amongst chemical products are first pipitzahoic acid and pipitzahuina, the extracts of a composite plant variously stated by different writers as, *Perezia fruticosa*, *Acourtia rigidia*, *Dumerilia alamani*, and in the Mexican catalogue as trixis pipitzahoac. The organic compounds extracted from this plant are described as interesting not only because of their novelty but of their prospects of future usefulness. Pipitzahoic acid is of a 'brilliant golden colour and of a soft silky texture, being contained either in an amorphous state or crystallized in small prisms and laminæ.' At present pipitzahoic acid is employed in medicine as a drastic purgative; it can also be used as a colouring matter."

It is remarkable that a substance so interesting as this acid should have received so little attention; but this may probably be due to the difficulty experienced in procuring a supply of the raw material. Yet the fact of it being extensively used in Mexico as a domestic purgative points to the probability of its existence there in some quantity, and within easy reach of the natives requiring it.

The method adopted by Herr Vigener to obtain the acid which he exhibited was making a tincture with 1 part of the powdered root and 5 parts of nearly absolute alcohol; to the tincture thus prepared, boiling water was added to a point of dilution when the acid separated from the fluid in crystalline scales; by repeated solution and recrystallization it was obtained in a tolerably pure state. All his samples, however, the results of extraction by different menstrua, on being sublimed, left more or less of a tarry residue. The sublimed product had also a trace of it, but he purposed experimenting further in this direction, and hoped by repeated sublimation to obtain an acid in a state of greater purity and free from the contamination. The fine purple colour which this acid yields when mixed with alkalies or alkaline carbonates induced Herr Vigener to think that in chemical investigation there was a future for this substance as a colour indicator.

Pipitzahoic acid appears to be an anthraquinone derivative, but differs from every other through the property it possesses of subliming without decomposition at a very low temperature, even that of a water-bath, and subsequently condensing in golden crystals.

Through the courtesy of Herr Vigener I was presented with a few of the roots and a very small quantity of his sublimed acid, and on my return to England it occurred to me that a histological investigation embodying the chief characters of the root without needless detail would possess some interest, more especially as the pipitzahoic acid is allied to and possesses some features in common with chrysophanic acid.

Botanically, the Perezia plant belongs to Mutisiaceæ, a subdivision of the Labiatifloræ (Compositæ); it has no representative in Europe, but is found, with allied plants, in Central America and Mexico.

The roots, as furnished me, were in pieces of from 8–10 cm. long and 2 mm. thick, externally of a brown or reddish-brown colour, more or less furrowed longitudinally on the surface, apparently through the shrinking of the root in the process of drying; its taste was decidedly bitter, leaving a pungency on the tongue which remained after the bitterness had passed off, and this pungency was somewhat persistent.

In a transverse section of the root the yellow spots of pipitzahoic acid were visible to the naked eye, and more distinctly seen in their relation to the other parts when the section was slightly magnified with a lens, as in fig. 1. A segment of the

Fig. 1. Section of root, slightly magnified.

same section more highly magnified is seen in fig. 2.

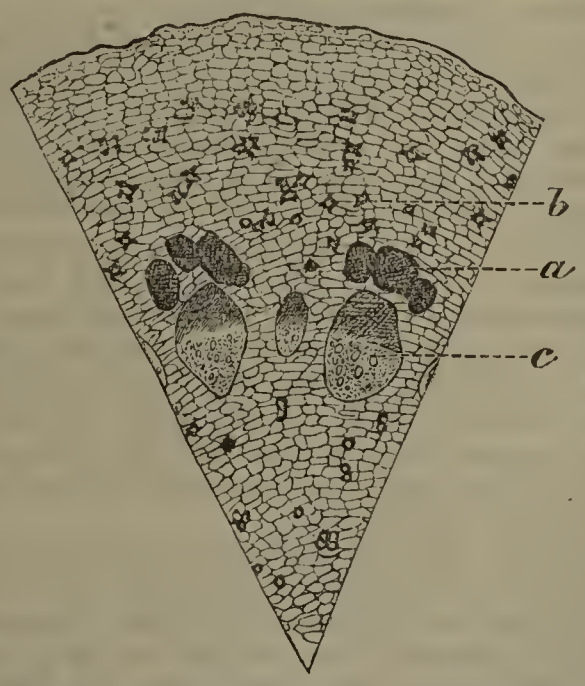

Fig. 2. Transverse section; *a*, pipitzahoic acid; *b*, stone cell; *c*, vascular bundle.

The outer cortical layer consists of a double row of thickened tabular cells, tangentially disposed and deeply coloured; this is followed by a layer, several cells deep, of collenchymatous tissue passing inward to the fundamental parenchyma of the root. *a* represents the pipitzahoic acid in its secreting cells, in groups of from three to five; the acid is in yellow lumps of a crystalline structure. These depositories of the acid, striking in the entire section, are arranged in a circle and correspond to the fibro-vascular bundles indicated by *c*. The stellate spots *b* scattered throughout the fundamental tissue from the collenchyma to the centre of the root are due to certain cells only of the tissue becoming thickened by secondary deposit, and converted into sclerenchymatous or stone cells with laminated structure, the intercellular spaces being filled with a dark coloured deposit. These cells are found mostly single, but occasionally in groups of two, three or more. Fig. 3 is a longitudinal section showing, in

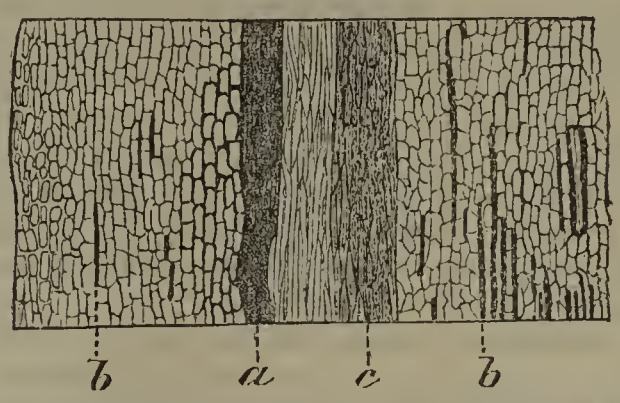

Fig. 3. Longitudinal section.—*a*, pipitzahoic acid *b*, stone-cell; *c*, vascular bundle.

addition to the relative positions of the cells referred to, the more characteristic constituents of the root as pipitzahoic acid, and the dark deposit around the stone cell traversing the length of the root. Fig. 4

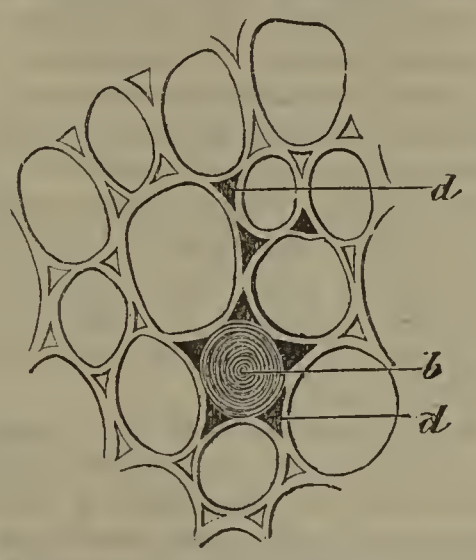

Fig. 4. Transverse section, showing a stone-cell.—*b*, stone-cell; *d*, intercellular secretion or deposit.

is a still further enlargement of the stellate spots as seen in fig. 2, the intercellular dark deposits with and without the presence of a stone cell are depicted in this drawing. Fig. 5 is a longitudinal section

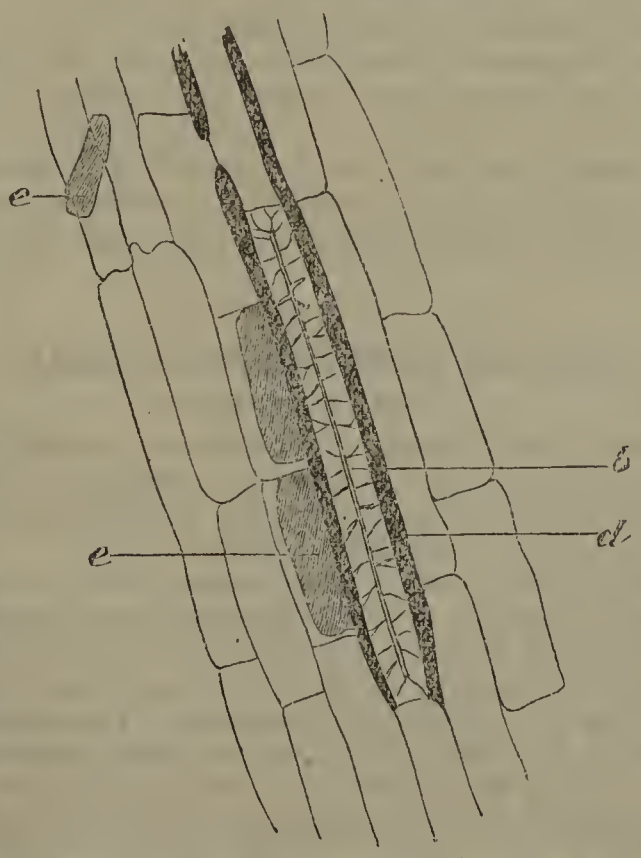

Fig. 5. Longitudinal section, showing a stone-cell. *b*, stone-cell; *d*, intercelluar secretion; *e*, inulin.

showing a stone cell in its entire length and surrounded throughout by the deposit just referred to. Most of the parenchymatous cells contain grains of inulin, which are seen at *e*, *Perezia* being one of the Compositæ, and containing inulin as the equivalent of starch present in the plants of other orders.

This brief account of the microscopical structure of the Perezia root will, with the drawings, serve to make the more salient features in its histology intelligible. The quantity of root placed at my disposal was only 2 grammes, and that of acid 0·33 of a gramme; it must, therefore, be obvious that few experiments beyond those afforded by microchemistry could be undertaken.

A transverse section of the root in which the lumps of pipitzahoic acid were visible was subjected to micro-sublimation on a microscopic glass slide, and at a little over 100° C. the acid sublimed on the cover-glass in yellow crystals. An alcoholic tincture of the root, yellow from solution of the acid, brought into contact with a dilute solution of caustic alkali or alkaline carbonate, developed that fine purple colour which induced Herr Vigener to suggest a probable future for the acid as a colour indicator in chemical investigations. The tincture on evaporation yielded crystals of pipitzahoic acid.

I was unable to satisfy myself as to the character of the intercellular dark deposit *d*. It was not affected by alcohol, ether, benzol, chloroform or turpentine; neither did caustic alkali dissolve it; it was decomposed by nitric acid. If from the negative results of these experiments I may be allowed to offer an opinion, it would be that the deposit in question is dried latex.

When the pipitzahoic acid first came under my notice it occurred to me as probable that its formation might be due to a degradation of tissue and a rearrangement of its elements similar to that which takes place in araroba or goa powder; but a careful anatomical investigation does not support that view. It appears to be a true secretion in certain cells occupying the same relative position throughout the root, and unaccompanied by any of that breaking down of the surrounding cells so marked in the microscopical investigation of araroba.

The *Perezia* may prove a valuable medicinal plant, but to determine that point there are yet wanting those careful therapeutic investigations which should precede the appearance in general practice of any new drug, a series of well conducted experiments which very few seem capable of conducting, and for the results of which still fewer have the patience to wait.

DIASTATIC FERMENT OF BACTERIA.*

BY J. WORTMANN.

Recent investigations have conclusively established the universal occurrence of diastatic ferments in different parts of plants, and have thrown a new light on the processes of nutrition and fermentation.

According to earlier observations, the presence of diastase in the plant was limited to germinating wheat or barley, and knowledge in regard of its wider diffusion has been advanced by the recent works of Gorup-Besanez, Will, Kranch, and especially Baranetzky. The researches of Musculus, E. Schulze, O'Sullivan, and others, have afforded an insight into the quantitative relations and the modifying external factors of temperature and acidity concerned in the action of diastase in the transformation of starch into glucose.

Having in view the action of bacteria as causes of putrefaction or fermentation, in which the destruction of the putrescible or fermentescible body is accomplished by the appropriation for the purpose of nutrition by the bacteria of constituent nitrogen or carbon, the question may be asked—Can bacteria also obtain their carbon from starch, just as by the researches of Pasteur and Cohn they have been proved to be capable of obtaining it, not only from sugar but from ammonium tartrate? Are bacteria, by the secretion of a starch-transforming ferment analogous to diastase, or in any other but not clearly defined way, capable of transforming starch into soluble, diffusible, and nutrient combinations? Notwithstanding the numerous investigations into the chemical and physiological relations of bacteria, very little has been made out in regard to their action on starch—a circumstance from which it may be presumed that the solution of starch by bacteria can be effected only in certain instances. In his work, 'Ueber die niederen Pilze,' Naegeli refers to the secretion by these organisms of a special energetic ferment capable of changing milk-sugar into fermentescible sugar, starch and cellulose into glucose, and of dissolving coagulated albumin and other albuminates, and Sachsse alludes to the circumstance of starch solution undergoing no change so long as it is protected from the influence of organic germs by which otherwise it quickly undergoes transformation.

Some experiments, made by the author in the summer of 1881 with milky juices, led him to believe that certain appearances of corrosion exhibited by the starch granules present must be due to the action of bacteria. The result of further precise experiments, undertaken to decide this point, led to the conclusion that bacteria are capable of drawing their supply of carbon from starch, and that the appearances of solution or corrosion exhibited by the solid starch granules are identical with those caused by the action of diastase or saliva.

The method used by the author was as follows:—To about 20 or 25 c.c. a mixture of inorganic salts (sodium chloride, magnesium sulphate, potassium nitrate, and acid ammonium phosphate) in equal proportions was added to the extent of 1 per cent. The same quantity of solid wheat-starch was then added, and the liquid then inoculated with one or two drops of a strongly bacterial solution, shaken, corked, and allowed to remain in a room at a temperature of 18° to 22°. [*Bacterium termo* was the predominating organism in the inoculating fluids employed.] In from five to seven days, the first signs of commencing corrosion of the starch grains become visible, the larger grains being the earliest attacked, and much later, when these have almost completely disappeared, the lesser granules are attacked.

In a second series of experiments soluble starch was substituted for the solid form, the progress of the reaction being watched by the aid of iodine. Samples taken from time to time exhibited at first the blue colour, then violet or dark red, passing to wine-red, and, finally, when the starch had disappeared, underwent no change.

As Baranetzky has shown, the starch granules of different kinds are acted on with very unequal rapidity by the diastatic ferments of plant juices, the strongest ferment of all—malt diastase—being well known to have no perceptible influence, even after long exposure, on solid potato-starch granules, whilst wheat and buckwheat are dissolved with facility.

Experiments were made with a view to ascertain whether the action of bacteria on starch was analogous; in these, wheat-starch grains are shown to be by far the most readily attacked by bacteria—in several instances having even completely disappeared before other sorts of starch were attacked. Differences were also noticed in regard to the times when palm-starch, canna-starch, turmeric-starch, and iris-starch were attacked, their degree of resistance being in the order given. Potato-

* From *Zeitschr. Physiol. Chem.*, vi, 287–329. Reprinted from the *Journal of the Chemical Society*.

starch alone resisted attack. When wheat starch in the solid state was mixed with starch solution or with starch-paste, the solution became entirely (and the paste in greater part) changed before the solid granules were attacked.

With regard to this unequal power of resistance shown by different kinds of starch, the author concludes from his further observations, that the difference of rapidity with which a given kind is attacked and dissolved by a ferment is inversely proportional to its density, provided always that the granules in question are entire and uninjured by cracks or fissures. In the same way are explained the differences in point of time in which granules of the same kind are sometimes observed to undergo change accordingly as these are intact or otherwise.

The cause of potato-starch, or of bean-starch, and, even under certain conditions, wheaten starch resisting attack, in spite of the abundant presence of bacteria, is apparently to be sought for in the fact that other more easily accessible sources of carbon nutriment were also present, certain albuminoid constituents of the potato slices or of the beans employed affording this more readily than the starch granules, just as in the experiments, above cited, with wheaten starch solution and solid wheaten starch, the former was preferentially attacked ; only after all, or at the least chief portion of the albuminoids present, had been used up was the starch in these cases attacked.

Experiments were also made with the same results in which, after Cohn, ammonium tartrate was employed along with starch as a nutrient medium for the bacteria, with the result that so long as even a trace of this salt was present with the starch, the latter was not attacked by bacteria in the slightest degree, but, on its disappearance, appearances of solution became at once visible in the starch granules. Another point was also established in the course of these experiments, that if air is excluded, no appearances of corrosion or solution of the starch granules are manifested.

Other researches were made to answer the problem as to whether the nature of this action of bacteria on starch was such that an unformed ferment analogous to diastase was secreted by those organisms to which the corrosive appearances may be ascribed, these being, as already stated, precisely similar to the resulting action of diastase itself.

That the starch in the process became changed in part to glucose was easily ascertained by testing with Fehling's solution, and a detailed series of experiments, made with a view to eliminating if possible the ferment itself, yielded evidence showing that bacteria possess the remarkable property of producing a starch-transforming ferment only when no source of carbon other than starch is at their disposal, and this ferment is incapable of changing albumin into peptone, just as in the case of diastase. It is well known that the pepsin of gastric juice acts only in an acid medium. The plant juices which possess a diastatic property exhibit likewise a more or less acid reaction, so that as Baranetzky assumes, the co-operation of an acid in the case of diastase is a necessary condition of its activity. The solutions in which starch in one or another form was submitted to the action of bacteria were always slightly acid, due to the presence of acid ammonium phosphate, and when the solutions were purposely made neutral, the process of starch transformations went on more slowly. Detmer some time since has shown that addition of small quantities of citric acid to a solution containing diastase, hastens its action on starch. The author's observations are in harmony with this, but in addition show that the process of starch transformation by bacteria is capable of going on in the absence of acid, and that the bacteria do not yield any acid in the process. The results of the author's researches may be briefly recapitulated.

1. Bacteria are capable of acting on starch, whether in the solid state, as paste, or in solution, in a manner analogous to diastase.

2. As in the case of diastase, different kinds of starch are attacked by bacteria with different degrees of rapidity.

3. The action of bacteria on starch is manifested only in the absence of other sources of carbon nutriment, and when access of air is not prevented.

4. The action of bacteria on starch is effected by a ferment secreted by them, and which, like diastase, is soluble in water, but precipitable by alcohol.

5. This ferment acts precisely as diastase in changing starch into a sugar capable of reducing cupric oxide, but is not possessed of peptonizing properties.

6. The ferment itself is also capable of acting on starch in the absence of oxygen.

7. The ferment is secreted by the bacteria also in neutral solution of starch, and exerts its influence under these conditions.

8. This influence is expedited in slightly acid solutions.

The author concludes his paper with speculations as to the conditions under which bacteria are capable of generating this amylolytic (diastatic) ferment, instead of the ordinary peptonizing one.

MEDICATED WATERS.*

BY JOSEPH W. ENGLAND, PH.G.

The U. S. Pharmacopœia of 1870, in the formulæ for these waters, gave in all cases, either one or the alternative of two processes. First: Distillation of the odorous part of the plant with water, after previous comminution and maceration if necessary; or, second: Trituration of the volatile oil of the plant with magnesium carbonate, the addition of distilled water and filtration.

During the process of "distillation" the water carries over with it in suspension the vapour of the oily product used and both are condensed in the receiver in separate layers. The oily portion is separated by suitable apparatus, leaving the water impregnated with its taste and fragrance. The fragrance is at first masked with a foreign odour that gradually disappears on exposure to air; leaving the true one, partially modified to one of finer quality, through the supposed presence of certain volatile acids and compound or mixed ethers. Distillation while admittedly the best in comparison with the present methods pursued, is to a great extent in the limited uses of most pharmacists impracticable for general employment. It requires for its successful exercise, the manufacture on a large scale, great care and skill on the part of its operators, and the use of vegetable products of quality seldom found in commerce to secure the best results. Its general application, therefore, is far from being a universal one.

The process of triturating the oil with magnesium carbonate is directed for the property possessed of reducing, mechanically, the size of the oily globules in order to present a greater surface to the solvent action of the water. The main objection to its use, rests upon the fact of its appreciable solubility in distilled water and to a still greater extent, when ordinary water containing in solution, as it usually does, carbonic oxide. The medicated waters thus made and holding in solution this alkaline-earth salt may, when prescribed with alkaloids, their salts or certain metallic oxides, precipitate them from solution on standing and possibly lead to grave and serious results. To overcome this defect the substitution of paper-pulp, chalk, pumice stone, or charcoal has been proposed. These, however, are poor expedients and all fail through their inherent lack of the necessary power of diffusion of the oily ingredient upon trituration. The advantages of the "trituration process" to the general pharmacist are so manifold that they scarcely need comment. The readiness of manufacture on a small scale, the short time necessary for its performance with results

* From the *American Journal of Pharmacy*, February, 1884.

equally satisfactory, except in a few isolated instances, and the cheapness of preparation, are a few of the points of value which yield it preference for general usage.

The late revision of the U. S. Pharmacopœia discards, entirely, the use of the "trituration process" and employs in its stead a method which consists, simply, in the distribution of the oil, in small portions at a time, upon cotton; picking the same apart after each addition until the whole is thoroughly impregnated with it, packing in a conical glass percolator and displacing with distilled water. The exceptions to this mode are bitter almond water, prepared by direct solution of the oil in water by agitation, and rose and orange flower waters made by distillation. A practical acquaintance with this process does not impress one with either its worth or general utility. Its supposed advantages are more than counterbalanced by the very unsatisfactory results arising from its use. In the first place when the oil is added to the cotton, no matter how faithfully its dissemination may be executed, a large proportion is necessarily lost upon the fingers in picking the fibres apart. Then when it is placed in the percolator, if packed too loose, the added water rushes through without dissolving any of the oil. If too tight, the process is impeded to such an extent that percolation becomes impossible. The right degree of packing is hard to obtain and when secured yields but little better results. As to the use of distilled water, very few follow the pharmacopœial directions in this particular. Without exceptions, all pharmacists with whom the author has conversed substitute ordinary water and claim in extenuation, that extreme purity of that liquid is unnecessary, and that they are perfectly justified in the replacement from the fact that distilled water is frequently of a musty, unpleasant odour, vapid and disagreeable taste, and as likely may contain metallic impurities from the uncertain, careless methods of commercial manufacture; further their efficiency is called into question from the physiological fact that distilled water is difficult of digestion and not as acceptable to irritable stomachs. These statements may be regarded as extreme, yet it must be admitted that the greatest efficiency of all medicines is desired, in a physiological sense as well as a pharmaceutical one. If the reasons advanced are tenable and do not arise from economic considerations they are certainly worthy of further notice. Certain it is that the products made by them, seem to give equal satisfaction with those made by standard authority. In whatever way we view the U.S. (1880) process, its wasteful and objectionable manipulations are so evident, that if the imperfections in the directions of the earlier Pharmacopœia (1870) were open to severe comment, those of the latter (1880) are doubly so by comparison.

As previously stated, the greater the subdivison of an oil, when brought in contact with an aqueous solvent, the larger the quantity that will necessarily be taken up in solution. As an aid to this fact and also their supposed insolubility, rests the adaptability of the bodies mentioned above as diffusive agents. Some of the objections to the use of magnesium carbonate and several of its proposed substitutes have already been noted. Upon trial I have found precipitated calcium carbonate to be preferable, mechanically, to the magnesium salt; yet it is open to the same adverse criticisms. Another possibly important objection to the use of alkaline earth carbonates, which has not been previously discussed, may reside in the fact of the presence of odorous volatile acids, ethers, etc., in the volatile oils used and the neutralization of those acids by the alkaline carbonates, to form neutral and inodorous bodies, which may or may not be soluble. This view is a plausible one when we consider the delicate chemical constitution of the oils in general, especially those containing the previously mentioned compounds. Upon this fact may be based the superiority of "distilled" over "triturated" waters, as in distillation the water is impregnated with the oil direct and unchanged; while in trituration, if performed with carbonates, some changes undoubtedly ensue, since the products from the latter process are of less fine qualities than those of the former; although both may be made from the same oil. It is absolutely necessary on this account, to use a body free from these objectionable features and one which has all the essential requisites in the greatest degree. After numerous trials I have found precipitated calcium phosphate to possess all the desired properties and to yield products that were in all respects the equal of those obtained by distillation.

This lime salt is a neutral, impalpable solid, wholly insoluble in water, neutral or carbonated, and when used permits filtration much more readily and effectively than any other medium. In diffusive power it is fully the equal of any of the bodies previously mentioned; leaving nothing to be desired. Before its use, although generally very pure, tests should be always applied to determine that fact. It should be wholly soluble in dilute hydrochloric acid without effervescence (absence of carbonates). Its washings with distilled water should yield no opalescence or precipitate with test solutions of silver nitrate (absence of chlorides), barium chloride (absence of sulphates) or ammonium oxalate (absence of soluble lime salts).

When diffusive agents are used, they require long and persistent trituration with the oil to effect thorough and minute subdivision. In order to promote this diffusion, a plan of diluting the oil with a small quantity of alcohol was tried and found to work admirably. The presumed presence of alcohol in medicated waters thus made, has no foundation in fact, if the directions in the general formula, hereinafter given, are followed, as the rubbing to dryness necessarily volatilizes the whole of it.

General Formula. — Triturate, in a mortar of broad surface, the oil dissolved in the alcohol, with the precipitated calcium phosphate, until a dry powder is secured and all the alcohol has volatilized, then add the water in small portions at a time, stirring after each addition, until the intended quantity to be made is completed. Lastly, filter; returning to the filter the first portions, if cloudy."

The following formulæ, under each heading, are expressed in two ways. One according to the method of the U. S. P. of 1870, and the other like that of the U. S. P. of 1880.

Aqua Anethi, Br.—Oil of dill, ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of dill, 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Anisi, U. S.—Oil of anise, ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water a sufficient quantity to make the finished product measure 2 pints. Or, oil of anise, 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Aurantii Florum, U. S.—Oil of neroli (Bigarade), 12 minims; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of neroli (Bigarade), 2 parts; alcohol, 15 parts; precipitated calcium phosphate, 20 parts; distilled water, a sufficient quantity to make the finished product weigh 2500 parts.

Aqua Amygdalæ Amaræ, U. S.—Oil of bitter almonds, 15 minims; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of bitter almonds, 1 part; distilled water, a sufficient quantity to make the finished product weigh 1000 parts. Dissolve the oil directly in the water by agitation. Since 1 part of the oil is soluble in 300 parts of water, no further directions are necessary.

Aqua Camphoræ, U. S.—Camphor, 2 drachms; alcohol, 1½ fluid drachms, precipitated calcium phosphate, 4 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, camphor, 8 parts; alcohol, 6 parts; precipitated calcium phosphate, 15 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts. Reduce the camphor in a mortar to a thin, smooth paste with the alcohol, add the precipitated calcium phosphate, and proceed as in general formula.

Aqua Cinnamomi, U. S.—Oil of cinnamon (Ceylon), ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of cinnamon (Ceylon), 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Fœniculi, U. S.—Oil of fennel, ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of fennel, 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Menthæ Piperitæ, U. S.—Oil of peppermint, ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water a sufficient quantity to make the finished product measure 2 pints. Or, oil of peppermint, 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Menthæ Viridis, U. S.—Oil of spearmint, ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of spearmint, 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Pimentæ, Br.—Oil of allspice, ½ a fluid drachm; alcohol, 1½ fluid drachms; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of allspice, 2 parts; alcohol, 6 parts; precipitated calcium phosphate, 8 parts; distilled water, a sufficient quantity to make the finished product weigh 1000 parts.

Aqua Rosæ, U. S.—Oil of rose, 6 minims; alcohol, 1 fluid drachm; precipitated calcium phosphate, 2 drachms; distilled water, a sufficient quantity to make the finished product measure 2 pints. Or, oil of rose, 2 parts; alcohol, 30 parts; precipitated calcium phosphate, 40 parts; distilled water, a sufficient quantity to make the finished product weigh 5000 parts.

In conclusion, the author, in advocating the adoption of the preceding formulæ would say that any means used to insure success, are always secondary in importance to the quality of the materials used. No process, however good in itself, can hope to remedy defects in the qualities of its ingredients, or the hasty, careless manipulations of its operators. With these guarded against, there need be no disappointment in the results obtained.

AMERICAN DRUGS.*

BY J. MOELLER,

Botanist and Microscopist of the Imperial Forest Institute, Mariabrunn, near Vienna.

(*Continued from page* 565.)

4. HERBA MONARDÆ FISTULOSÆ (WILD BERGAMOT, HORSEMINT).

The coarsely-cut dried leaves gathered when the plant is in bloom. The square often violet-tinted stem is almost bare, except that it is quite hairy and somewhat swollen at the points whence the leaves proceed in pairs. These (Fig. 6*a*) are approximately oviform, somewhat pointed, rounded at the base, short-stemmed, coarsely

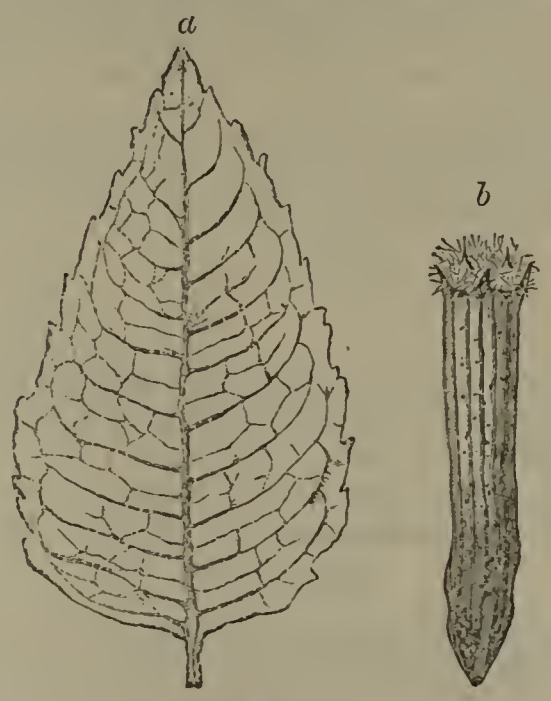

Fig. 6.

indentated at the edge, 5 cm. long, 3 cm. broad (those around the flowers being smaller, narrower and contracted towards the stem), with prominent middle and secondary nerves, the latter anastomosing towards the border. The leaves are rather smooth on both sides. The microscope, however, shows that these leaves are densely covered with small hairs, mostly but ·05 mm. in length, and consisting of but a single cell (Fig. 7)

Fig. 7.

highly interspersed with larger ones, particularly towards the edges, where they often consist of many cells. The scattered spots prove to be indentations in which the characteristic oil glands of the labiatæ are to be met with on their short broad stems. The flowers are arranged in dense pseudo verticils in the axils of the leaves, and are encircled by a thick-leaved bristly border. The calyx is nearly a centimetre in length, skinny, tubular, multiribbed, five-pronged, ciliated at the edge, naked and smooth on the inside, slightly hairy on the outside, displaying under the magnifying glass yellow glands (or glandular heads). The large double-lipped, flesh-coloured flowers are now but seldom found in the calyx.

The plant when dried has no specific odour; but when pulverized it has a penetrating aromatic odour, resembling peppermint. Its taste is strongly aromatic—almost free of bitterness.

Monarda fistulosa, L, is indigenous in the western states of the American Union. It is one of the plants most frequently met with in the territories of Montana and Dakota. It is nearest akin with the rosemary family. It is now about three years since wild bergamot (called also horsemint) was first applied as a curative. It was resorted to in cases of intermittent fever instead of quinine.

Dr. Woodward's (*Ther. Gaz.*, 1880, p. 224) reports of his experiments are as follows:—"I found that a drachm of the fluid extract every three hours, from the time of the height of the fever to the end of the attack, or

* Reprinted from the *Therapeutic Gazette.*

until a prickling sensation is felt throughout the body, or profuse sweating sets in, is the most appropriate dose for adults. In cases of simple intermittent fever, without any complications, this remedy has never disappointed my expectations, and I prefer it to quinine or any other febrifuge."

Dr. Woodward, however, does not undertake to call monarda an infallible specific for fevers, but maintains that it is well worthy of the careful notice of the medical profession.

(*To be continued.*)

THE USE OF LITMUS, METHYL ORANGE, PHENACETOLIN AND PHENOLPHTHALEIN AS INDICATORS.*

BY ROBERT T. THOMSON.

(*Continued from p.* 672.)

Table III.

Determination of ammonia existing as hydrate.
Ammonia (NH_3) employed for each test . ·547 gram.

Name of Indicator.	C.C. of Normal Acid consumed.	Grams of NH_3 obtained.
Litmus	32·4	·550
Methyl orange .	32·4	·550
Phenacetolin . .	32·4	·550
Phenolphthaleïn .	31·5—31·4	·535—·533

Before writing the above, I had not met with any mention of phenolphthaleïn as an indicator for the estimation of ammonia, but, quite recently, it has been recommended for this purpose by Richter, in a paper on a "New Volumetric Determination of Potassium Bichromate, and its use as a Standard for Caustic Alkalies" (see *Chem. News*, xlvii., 19). The process he has devised may be thus briefly described. To the caustic soda, potash or ammonia solution which has been previously coloured with phenolphthaleïn, add standard dichromate of potassium till the reddish-yellow colour produced is changed to a full yellow. At this point the alkali is neutralized, a monochromate of the alkali or alkalies is formed, and the reddish tinge due to the presence of the phenolphthaleïn in the alkaline solution is discharged when the least excess of acid chromate is consumed. The quantities advised for use are such that the solution in which the titration has been accomplished should measure 150 or 200 c.c., and contain about 1 gram of the monochromate of potassium. A solution of this salt, of the strength mentioned, is to be used as a comparison in deciding at what point the end reaction occurs. Following these instructions as closely as possible, I prepared a decinormal solution of potassium bichromate (14·76 grams per litre), and, also, decinormal solutions of caustic soda, potash and ammonia, the alkali liquors being tested against decinormal sulphuric acid. Fifty c.c. of the soda solution were transferred to a beaker, diluted with 50 c.c. of water coloured with phenolphthaleïn, and the decinormal bichromate solution added from a burette. The fine red tint soon changed to reddish-yellow, which lost little or none of its intensity till it nearly reached the neutral point. The end-reaction was thus easily observed, especially when compared with the solution of monochromate of potsssium of nearly the same strength as that operated upon. It must be carefully noted, however, that the change in colour is not instantaneous, as it is by titration with a mineral acid, so that when the test is nearly finished, a minute or two must be allowed to pass after each addition before coming to any conclusion as to whether the end-reaction has taken place. Otherwise a high result will be the consequence. The results of two tests were, that 50 and 50·1 c.c. of the decinormal bichromate were consumed, which are as near the truth as possible.

With regard to the determination of the potash, it is sufficient to mention that the results were substantially the same as those obtained with soda.

In estimating the ammonia in 50 c.c. of the decinormal solution of ammonia, the addition of the bichromate produced at first the reddish-yellow colour, which slowly disappeared on further addition, and gave place to the full yellow when 45·7 c.c. had been consumed in the one case, and 46 c.c. in the other. This gives a result so much below the truth, as to be equivalent to 8 per cent. of the whole ammonia present. From these results it is quite plain that Richter has not tested ammonia specially with phenolphthaleïn as indicator, but has simply assumed that it would act in precisely the same manner as potash and soda.

Table IV.

Comparison of results obtained in the estimation of alkalies by Richter's bichromate and the ordinary acid methods, phenolphthaleïn being the indicator.

Amount of soda used for each test . . ·1550 gram.
Do. potash do. . . ·2355 gram.
Do. ammonia do. . . ·0850 gram.

Name of Alkali determined.	C. C. of $\frac{N}{10}$ $K_2Cr_2O_7$ consumed.	Gram of Alkali obtained.	C.C. of $\frac{N}{10}$ acid consumed.	Gram of Alkali obtained.
Soda (Na_2O) . . .	50·1	·1553	50·1	·1553
Soda (Na_2O) . . .	50·0	·1550	50·1	·1553
Potash (K_2O) . . .	50·1	·2359	50·1	·2359
Potash (K_2O) . . .	50·2	·2363	50·0	·2355
Ammonia (NH_3) . .	46·0	·0782	47·1	·0800
Ammonia (NH_3) . .	45·7	·0777	46·9	·0797

V.—Determination of Alkalies existing as Carbonate and Bicarbonate.

It is not worth while going fully into the results of the tests made on this part of the subject. As almost all the noteworthy points have been already mentioned, I will just note a few necessary precautions. As is well known, litmus can be used in the direct estimation of soda and potash existing as carbonate or bicarbonate by an acid, but can only be applied to the determination of ammonia in that form when excess of acid is added, the solution boiled to expel carbonic acid, and titrated back with an alkali. The same remarks apply to phenacetolin.

Methyl orange can be employed equally well in the estimation of alkali in any of the alkaline carbonates, but special mention may be made of its application to the determination of ammonia in the commercial carbonate. This substance is a compound of bicarbonate and carbonate of ammonium, and when dissolved in water the latter of these salts takes up the elements of water and produces normal carbonate of ammonium. The sample tested did not contain any impurities except water, and 2·5 grams converted into chloride and dried at 100° C. showed ·725 gram of ammonia, while two experiments made with 2·5 grams, which consumed 43·1 and 43·05 c.c. of normal sulphuric acid, gave respectively ·732 and ·731 gram of ammonia.

Phenolphthaleïn, as stated before, cannot be used for the estimation of ammonia, and in the determination of soda and potash existing as carbonate or bicarbonate (the latter giving no colour with this indicator till decomposed by boiling), a somewhat tedious boiling is required unless excess of acid be added, the solution boiled and titrated back with caustic soda.

* Read before the Chemical Section of the Philosophical Society of Glasgow, January 22, 1883, and reprinted from the 'Proceedings.'

VI.—Behaviour of the Indicators with the Sulphates, Nitrates and Chlorides of the Alkalies.

Having considered the use of the indicators for the estimation of the alkalies when pure compounds are operated upon, we now come to the behaviour of the indicators with the common impurities present in commercial samples. This section, however, is chiefly concerned with the action (if any) of the neutral salts produced during titration. Litmus and phenacetolin are quite as delicate in presence of quantities of the sulphates, nitrates and chlorides of sodium, potassium and ammonium equivalent to 1·55 gram of soda (Na_2O) per 100 c.c. When these amounts of these salts were tested with the volume of methyl orange solution used in the foregoing experiments, it was found, as has been already stated, that about ·2 c.c. of normal acid was required to bring out the full pink colour as against ·05 c.c. when distilled water only was employed, although a distinct change was produced with ·05 c.c. in the former case. On the other hand, the delicacy of phenolphthaleïn is not affected by the salts of sodium and potassium mentioned above, but quantities of sulphate, nitrate and chloride of ammonium, equivalent to ·85 gram of ammonia per 100 c.c., required about 1·5 c.c. of normal caustic soda to produce even the faintest red colour, showing that ammonia and its salts must be carefully excluded when this indicator is made use of.

VII.—Effect of the Sulphites of the Alkalies.

A sample of ordinary normal sulphite of sodium was selected, tested for impurities, and the sulphurous acid, sulphuric acid, and soda determined to make certain that it was of the proper composition. This was found to be the case, and a solution was prepared of which 50 c.c. (the amount used for each test) contained 3·15 grams of sulphite of sodium. This is equal to 1·55 gram of soda (Na_2O).

Litmus.—On adding the normal acid to the portion tested with this indicator, the solution remained quite blue till about 12 c.c. had been added, but after that it became purple and slowly passed into the red. The end-reaction was observed by comparing with a solution containing the same quantity of litmus reddened. 24·9 c.c. were consumed, which is equal to ·771 gram of soda, or very nearly half that contained in the sulphite of sodium. When boiled, the colouring matter is destroyed.

Methyl orange.—In this case 25·1 c.c. of the normal acid were consumed, which is equal to ·778 gram of soda—a result slightly higher than that obtained by litmus, but still practically the same. The end-reaction was, unlike that of litmus, very sharp and decided.

Phenacetolin.—With phenacetolin the result was exactly the same as that procured with methyl orange; but, as in the case of litmus, the colour changed so gradually that the end-reaction was not very sharply defined.

Phenolphthleïn.—Sulphite of sodium is practically neutral to phenolphthaleïn, but, as has been shown, it is strongly aikaline to the other three indicators. Only ·2 c.c. of normal acid was necessary to discharge the red colour in the cold, but when boiled 4 c.c. were required. On cooling and titrating back, 3·8 c.c. of normal alkali were consumed; so that when this method is employed, the practical neutrality of sulphite of sodium may be depended upon, provided too much acid is not added before boiling. If a large excess of acid were used the boiling would expel sulphurous acid, and a high result would be the consequence.

It need only be added that potassium and ammonium sulphite act towards these indicators in the same way as the sodium compounds, except in the case of the ammonium salt with phenolphthaleïn, which cannot be used in presence of ammonium compounds.

Table V.

Results obtained in the titration of sodium sulphite with normal acid.

Amount of Na_2SO_3, used for each test. 3·15 grams.
Equal to Na_2O . . . . . 1·55 grams.

Name of Indicator	C.C. Normal Acid consumed.	Grams Na_2O obtained.
Litmus	24·9	·772
Methyl orange	25·1	·778
Phenacetolin.	25·1	·778
Phenolphthaleïn (cold) .	·2	·006
Phenolphthaleïn (boiled).	4·0	·124

VIII.—Effect of Thiosulphate of Sodium.

This salt, which is known better as the hyposulphite of soda, is perfectly neutral to litmus, methyl orange, phenacetolin and phenolphthaleïn.

IX.—Effect of Sulphide of Sodium.

To obtain pure normal sulphide of sodium a solution of sulphuretted hydrogen was prepared, the strength of which was determined by oxidization in an alkaline solution with peroxide of hydrogen, and precipitation with chloride of barium. Exactly enough hydrate of sodium was now added to form Na_2S, and the solution made up to such a volume that 50 c.c. (the quantity operated upon) contained ·284 grams of the sulphide.

Litmus.—When thoroughly boiled after each addition of acid to expel the sulphuretted hydrogen, an excellent result was obtained, 7·2 c.c. of normal acid being consumed. This is equal to ·280 grams of sulphide of sodium.

Methyl orange.—With this indicator the same number of c.c. of acid was consumed as with litmus. The liberated sulphuretted hydrogen had evidently no effect on the colour, as the end-reaction was quite sharp. This has been pointed out by Lunge.

Phenacetolin behaves in much the same way as litmus, the boiling off of the sulphuretted hydrogen being necessary to the obtaining of a decided change in colour when the end of the experiment is reched. The result was the same as that obtained with litmus.

Phenolphthaleïn gave rise to the characteristic red colour with the sulphide of sodium; but this colour was discharged after the addition of 3·55 c.c. of normal sulphuric acid. This is practically equal to half of the sodium sulphide, and shows that the sodium hydrogen sulphide—which is formed by the combination of the normal sulphide with the liberated sulphuretted hydrogen—is neutral to phenolphthaleïn. On boiling the solution the red colour returned, and, altogether, 7·15 c.c. of the acid were consumed—the whole of the sodium sulphide being thus estimated.

Potassium and ammonium sulphides have exactly the same same effect as the sodium compound, always excluding phenolphthaleïn with regard to the ammonium salt.

Table VI.

Results obtained in the titration of sodium sulphide by normal acid.

Amount of Na_2S employed for each test . . ·284 gram.

Name of Indicator.	C.C of Normal Acid consumed.	Grams of Na_2S found.
Litmus	7·2	·280
Methyl orange	7·2	·280
Phenacetolin.	7·2	·280
Phenolphthaleïn (cold) .	3·55	·138
Phenolphthaleïn (boiled).	7·15	·278

(*To be continued.*)

THE PUBLIC PRESS ON THE SALE OF POISONS.

From the OLDHAM CHRONICLE, *February* 23.

"Much attention has been drawn lately to the unfortunate facility with which poisons can be obtained by persons with suicidal tendencies, or for such purposes as the poisoning cases at Liverpool, and it is to be hoped the subject will not be dropped before something is done to remedy the grievance. It is a crying evil, and we are not surprised at newspapers all over the kingdom calling for some alteration of the present state of things, which is disgraceful to a civilized community. The Pharmacy Act, of 1868, was intended to abolish this practice; but, unfortunately, it has proved inadequate. By that Act it was made compulsory on chemists, under heavy penalties, to label certain scheduled articles with the vendor's name and address, the name of the substance, and the word "poison." In this class were included laudanum, paregoric, and all preparations of opium, oxalic acid, and many other deadly drugs; while in respect to vermin killer, prussic acid, and others, the sale was also to be registered, and the articles only to be sold to persons known to the vendors, or introduced by a witness known to the seller. The same law also enacted, for the safety of the public, that after December 31, 1868, it should be unlawful for any person to sell or keep open shop for the purpose of retailing, dispensing or compounding poisons who was not a registered chemist, and that no person should assume the title of chemist, or any such similar name, under the penalty of £5; and it was also enacted that no person should be enrolled as a chemist unless he showed his fitness for the work by passing certain severe examinations approved of by the Privy Council. There is nothing in it to prevent an unregistered man keeping a chemist's shop, provided he does not call himself a chemist, druggist or pharmacist. He can call his shop a "drug shop," or himself an "herbalist" or "drysalter," and not offend, so long as he does not sell poisons enumerated in the Act. But this he is bound to do after a time from the fact that they are things in daily demand, and when his customers ask for syrup of squills or some other simple cough remedy they are annoyed at not being supplied with paregoric or syrup of poppies to go with it, and so he has to break the law to retain his business. Hence the great danger to the public. People who knowingly break the law for the purpose of gain have easy consciences, and to this source many mysterious deaths might be traced, but for one fact, viz., that these illegal traders seldom label the goods they sell, and so the chance of being detected is lessened. Another great evil is the habit, that is daily gaining ground, of small grocers and hucksters selling "Godfrey's Cordial," cough mixtures, and other articles containing opium, in violation of the Act. The extent to which these things are done is shown by the evidence given at an inquest, at St. Helen's, a few days ago. Superintendent Johnson, in answer to the coroner, stated that in St. Helen's alone there were ninety-three such shopkeepers, who sold preparations containing opium and other powerful drugs, such as the preparation that had caused the death of the child upon whose body the inquest was held. The jury, very properly, desired to make a presentment that these people should be absolutely prohibited from selling these things, and that the law should be put in force against them. But then arises the question—whose business is it to carry out the law, and why is it not done? The answer is, "Everybody's business is nobody's business." It is in the power of the Registrar of the Pharmaceutical Society only to recover penalties for falsely using the title of "chemist," but it is free for anyone to prosecute and recover penalties from all persons who sell poison otherwise than in accordance with the Act. It is a matter for the police to take up, and, perhaps, this would have been done long ago but for a want of knowledge of the provisions of the Act."

MENTHOL CONES AND THE MEDICINE STAMP ACT.

We have been favoured by Messrs. T. Christy and Co. with copies of the following correspondence:—

"The Commissioners, "*February* 15, 1884.
"Inland Revenue,
"Solicitor's Department, No. 84,
"Somerset House.

"Sirs,—Referring to our two interviews with you on the subject of menthol cones, we understand—

"1. That if pure menthol (*Mentha arvensis, f. piperascens*) is used, under these circumstances we may use labels and forms of advertisement advocating these cones as a remedy and relief in cases of nerve pain, neuralgia, headache, etc.

"2. Should wax or any other substance be added to the menthol, then it will be liable to the usual patent medicine stamp.

"3. Should advertisements in the papers, handbills or circulars of any firm recommend any 'mixture of menthol,' it is liable to the Act, and must be sold under a stamp.

"4. It has been suggested that as the wax prevents the menthol in the cone causing too much irritation of the skin, and again as the wax facilitates the plan of fixing the cone in a holder which is part of the box, that if a declaration were made on the label,—

Menthol . 90 per cent.
Wax . . 10 per cent., or

'Menthol cone with 10 per cent. of wax,' this would place it outside the claim for a stamp?

"We beg your reply to this letter making any point more clear that you may consider obscure, and we will make this decision known to the trade.

"We are,
"Your obedient servants,
(Signed) "THOMAS CHRISTY AND CO."

"R 1363, Stamps 18784.
"Inland Revenue,
"Somerset House, W.C.,
"*February* 21, 1884.

"Gentlemen,—The Board of Inland Revenue have had before them your letters of the 13th, 15th and 16th inst. to their solicitor in regard to the penalties incurred by your having sold unstamped 'Menthol Cones,' a preparation composed of menthol and wax, advertised for the relief of headache, toothache and neuralgia; and I am to acquaint you that upon the understanding that you will in future conform strictly to the provisions of the law, they have ordered that no further proceedings be taken in the matter.

"In reply to the inquiries contained in your letter, I am directed to state—

"1. That if pure menthol only be used, without any mixture with any other ingredient whatsoever, labels and advertisements recommending it as a remedy may be used without any liability to stamp duty being incurred.

"2. That should wax or other substance be added to the menthol it will, as recommended, be liable to stamp duty.

"3. That advertisements, handbills or circulars recommending any 'mixture of menthol,' would render the preparation chargeable.

"4. That a declaration on the label that the preparation consisted of—

Menthol . 90 per cent.
Wax . . 10 per cent.

would not avoid liability.

"I enclose for your information extracts from the Acts of Parliament regulating and imposing the stamp duty on medicines.

"I am, Gentlemen,
"Your obedient servant,
(Signed) "W. H. COUSINS."

The Pharmaceutical Journal.

SATURDAY, MARCH 1, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

ANTISEPTIC DRESSINGS.

ONE very perceptible result of the recent enormous development of the antiseptic mode of treatment in surgical cases, which is now commonly designated under the term "Listerism," is that the surgeon has attained to a wider perception of the services that the pharmacist is able to render to him as well as to other practitioners of the healing art. On the other hand, the pharmacist has watched with an interest at least as keen as that of other members of the community the gigantic strides that have been made during the last few years in the treatment of wounds, and has found himself able sometimes—in a humble degree, it may be—to contribute to the progress by the utilization of his technical knowledge in the manipulation of antiseptics. This greater approximation of the surgeon and pharmacist was well illustrated at a recent meeting of the Military Medical Society, at Woolwich, in a most interesting discussion that followed the reading of a paper by Surgeon-Major C. H. GODWIN, on "Antiseptic Surgery in its Application to Field-practice." It is not intended to trespass here upon the domain of surgery by referring in detail to the special subject of the paper; our purpose is rather to mention some statements that were accessory and accidental to the discussion and that seem to us to present points of interest to the pharmacist. But as the value of these points is necessarily dependent upon the importance of the principal topic, we may go so far as to say that from the statistics quoted and the general consensus of opinion in the discussion it is apparent that recovery from a wound—whether inflicted in a battle or by the knife of a surgeon—is largely dependent upon the immediate occlusion, when possible, of the wound by means of suitable antiseptic dressings. Professor REYHER, indeed, has divided his cases into the "*befingerte*" and the "*unbefingerte*," — *i.e.*, cases that had been fingered by somebody before himself and cases which had not,—and one quotation of statistics will serve to show what this difference may mean. In the Russo-Turkish war Professor REYHER happened to have fourteen cases of gunshot wound of the knee-joint, seven of which were "fingered" cases and seven were "unfingered." At the time of writing to Sir JOSEPH LISTER six out of the seven "fingered" cases had succumbed and the seventh was in high fever, whilst all seven "unfingered" cases were alive and only one had suffered from fever, which was attributed to a severe face wound that could not be treated antiseptically.

Of course, therefore, antiseptic dressings naturally formed an element of considerable importance in such a discussion, and it is to mention some of the experience in respect to these, as related by different speakers, that is the special object of our referring to the subject in these columns. The author of the paper does not manifest a very marked preference for any particular dressing, provided that it be light, dry, antiseptic and absorbent, as, for instance, salicylated lint or cotton, boracic lint or cotton, or absorbent cotton; though he thinks a prepared cotton wool has the advantage that even if all the antiseptic has disappeared it would still act as a mechanical filter. Dr. W. F. STEPHENSON referred to the differences between non-volatile antiseptics, of which salicylic acid, and to a lesser degree boracic acid, might be taken as a type, and volatile antiseptics. He pointed out that whilst eucalyptus oil is valuable on account of its non-irritant properties, it is highly volatile and under certain climatic and other conditions might volatilize and leave the dressing in this respect useless. He, however, finds eucalyptus oil useful in the preparation of an antiseptic "cream," which is enclosed in an ordinary collapsing tube such as is used for scent fountains and is thus available in a portable form for anointing fingers or instruments before an operation, or even for pouring into a wound. He also described a dressing made by saturating spongio piline with a definite proportion of salicylic acid and then covering it with a film of wax impregnated with a volatile antiseptic, such as eucalyptol or carbolic acid, by which means he considers an antiseptic absorbent is provided so as to receive any discharge, together with the material for maintaining an antiseptic atmosphere in contact with the surface of the wound. Sir WILLIAM MACCORMAC, whose wide experience in military surgery allows him to speak authoritatively, said that of all known antiseptic substances iodoform seemed for the first dressing of the wounded by far the best, as it possesses the valuable properties of being very little poisonous unless applied in undue quantity, non-irritant to a wounded surface, insoluble in the discharge from a wound, and volatile and antiseptic to a remarkable degree. Deputy-Surgeon-General MARSTON also referred to the use in Egypt of iodoform as an application to wounds or, mixed with other substances, to the eyelids in purulent ophthalmia, and said that since seeing the results there he had had some miniature dredges made for using the remedy. It appears that in an advanced depot for the wounded on the day of the

battle of Tel-el-Kebir, the treatment adopted was first to wash the wound and surrounding part with a solution of carbolic acid (1 in 20) and then to dust the wound lightly over with iodoform; next a piece of protective was dipped in the carbolic solution and laid upon the wound, upon which were placed two or three layers of boracic lint and above that the gauze bandage. The cases so treated did very well: when visited at a subsequent date there was no smell; the hospital atmosphere was perfectly pure and the wounds showed little or no discharge. As a material Professor LONGMORE spoke very highly of "wood wool," in respect to its absorptive powers, which he said exceeded those of cotton-wool, tow, or any substance of the kind. But although extremely soft, elastic and absorbent it has the disadvantage of not exercising any antiseptic action upon the discharge taken up by it; consequently although half a grain per cent. of corrosive sublimate is found sufficient to keep the "wood wool" itself aseptic and preserve it from putrefactive change that quantity does not seem sufficient to rely on for the protection of the wound also.

It may be almost assumed that the interest of the meeting to the surgeons present culminated in the speech of Sir JOSEPH LISTER, nor are his remarks by any means devoid of interest to pharmacists. The antiseptic to which he referred chiefly was corrosive sublimate, of which substance he appears to entertain a very high opinion on account of its wonderful effectiveness, combined with its cheapness. Referring to its use with "wood wool," he objected to that substance on account of its bulkiness, and also, like Professor LONGMORE, because the conditions under which the antiseptic is present in it are not satisfactory. Sir JOSEPH LISTER is of opinion that linen rags form at least as effective a material after they have been steeped in a solution of corrosive sublimate and dried. At present he is engaged in making some experiments with a view of obtaining corrosive sublimate in a more convenient form for application, and as a step in this direction he proposes to utilize its great solubility in glycerine. Although this property is not usually mentioned in text-books, it is not a new observation, as the speaker appears to think, for at least a quarter of a century ago corrosive sublimate was included by PARRISH in a list of substances "readily soluble in glycerine," and the fact is mentioned also in STORER'S 'Dictionary of Solubilities.' Sir JOSEPH LISTER has found that corrosive sublimate is soluble in one and a half times its weight of glycerine in the cold, and this concentrated solution he proposes to dilute with water as required to form a solution of 1 in 1000, or other desired strength. For the preparation of antiseptic rags he recommends to dilute the glycerine solution with two hundred parts of water and use this aqueous liquor for steeping them in. Sponges also may be preserved in an aseptic condition most advantageously by means of this agent; for although when purified with carbolic acid they remain in a satisfactory condition for a considerable time, eventually the carbolic acid will leave them, in virtue of its volatility, whereas after purification with a solution of corrosive sublimate, sponges will remain aseptic an indefinite time until required for use. In a similar manner, instead of keeping carbolized catgut in oil, the speaker recommended that it be preserved dry, like silk, and simply dipped in the solution of corrosive sublimate for a few minutes when required for use. As to iodoform, Sir JOSEPH LISTER thinks that in the present state of our knowledge it is the agent that promises best as a first dressing for wounds with respect to portability and effectiveness. He considers it to be a very excellent antiseptic, although not the most powerful one; for it does not seem to destroy the poison of erysipelas so easily as carbolic acid, and it has been proved by experiment to be inferior to several antiseptics in destroying various bacteria. Nevertheless, in the form of iodoform wool it constitutes a very effective dressing, whilst in consequence of the non-irritating properties of iodoform and its insolubility in the discharges, he is disposed to think that to dust a wound over with iodoform powder and then cover it over with an absorbent substance, constitutes the best known treatment. For a similar purpose, Dr. LESSER, of Leipsic, has recommended that every soldier should carry in his knapsack a cartridge case full of an antiseptic powder consisting of two parts of boracic acid and one part of iodoform; but Sir JOSEPH LISTER would prefer the use of unmixed iodoform powder, on the ground that boracic acid is by no means so powerful an antiseptic as an equal bulk of iodoform.

An Evening Meeting of the Pharmaceutical Society will be held on Wednesday next the 5th inst., when a communication will be read on "Logwood as a Test for Metals," by Mr. Arthur Weddell, and a paper on "The Chemical Composition and Properties of a Crystalline Principle obtained from Jambosa Root," by Mr. A. W. Gerrard. The chair will be taken at 8.30.

* * *

On another page will be found a portion of a correspondence that has taken place between the Board of Trade and Messrs. T. Christy and Co., with reference to the sale of "menthol cones." It will be seen that the Board has decided that if pure menthol only be used, without an admixture of any other substance, "labels and advertisements recommending it as a remedy may be used without any liability to stamp duty being incurred;" but that should wax or other substance be added to the menthol it will, if so recommended, be liable to stamp duty. No reason is given by the Board for this decision, but in publishing it we think it right to recommend that in the absence of such an explanation the greatest circumspection should be exercised in applying the ruling to what might appear to be analogous cases. At the end of the Schedule to the Patent Medicines Act (42 Geo. III., cap. 60), there are some "special

exemptions" mentioned, among which are "all medicinal drugs whatsoever which shall be uttered or vended *entire* without any mixture or composition with any other drug," etc. It may be, therefore, that "menthol" is considered to be an "entire" drug; but we should like to know the opinion of the Board as to the definition of the essential oil of which it originally formed a portion before risking the application of the ruling to such an article.

* * *

A *projet de loi* has been introduced into the French Legislature for the reorganization of the inspection of pharmacies in France. It proposes that pharmacies and the stores of druggists and grocers shall be inspected at least once every year by special inspectors appointed by the Minister of Commerce. These inspectors, of whom there would be about ninety, or one for each department, would also be charged with the supervision and inspection of depots of mineral waters and manufactories of artificial mineral waters. In the pharmacy they would have the power to examine drugs and pharmaceutical preparations, as well as dietetic articles, and to confiscate any that might be found adulterated or to have undergone alteration, and also to deal with breaches of the law as to the sale of poisons or hydrocarbons. The fee payable for the inspection of a pharmacy would remain, as at present, six francs, and four francs for a drug store or grocery. The Bill has aroused the opposition of influential pharmacists, and it appears to be looked upon in some quarters as a covert blow at the Bill of M. Naquet, of which a summary was given in this Journal some months since.

* * *

Some further details have been published respecting the Paris Municipal Laboratory (see before, p. 345), from which we learn that the staff of the establishment consists of a director at a salary of £240, a deputy at £180, one first class chemist at £96, three second class chemists at £64 each and three attendants at £60 each. The "out-door," staff consists of eight first class inspectors who are paid £96 yearly each, eight second class at £72 each, and thirty-two ordinary inspectors. It would appear therefore that in Paris the services of an unskilled inspector are appraised at a higher money value than those of a skilled chemist. The number of the analyses made in the year was 6517, of which 3958 were gratuitous, 378 were paid for, and 2181 were ordered by the inspectors. The results reported were that 1565 samples were good, 1523 passable, 2608 bad, and 562 dangerous.

* * *

In a review of Proctor's 'Practical Pharmacy,' in the current number of the *Dublin Journal of Medical Science*, the writer makes some pertinent remarks upon the probable results of the tendency in the present day of some medical men, either through "ignorance or laziness," to ignore legitimate prescribing altogether. He says—

"Indeed it is by no means an unusual practice among some medical men, when called upon to prescribe, to do so not from any study or knowledge of their own of drugs or of disease, but with the aid of the last list of formulæ of 'selected remedies,' or of 'pills' or 'granules,' with perhaps an accompanying 'Index of Diseases,' that may have been sent to them by the active agent of some enterprising drug firm. Such a system of routine book-prescribing, although it may have some conveniences, is, we think, derogatory, and as likely to become injurious to the profession of medicine as to that of legitimate pharmacy, and certainly cannot add to the credit of either. If the public, as they surely will, find that they are being habitually dosed by book formulæ, they will probably, by procuring these lists for themselves, take their dosing into their own hands; and it is not impossible that, in some cases, by running his eye down the list, a patient might select as good a 'combination' for himself as would have been made by a practitioner who adopts such a system of prescribing."

* * *

In Victoria, towards the end of the year, fifty convictions were obtained in three weeks under the provisions of the Act for regulating the Sale and Use of Poisons, by which the sale of scheduled poisons is restricted to medical practitioners, registered pharmacists, and (in outlying districts) certificated dealers. A considerable proportion of the convictions were for the sale of chlorodyne, although that compound is not mentioned by name in the schedule to the Act.

* * *

It is announced that for the encouragement of original research in sanitary science three Scholarships, each of the value of £250, tenable for one year, are offered for competition by the Grocers' Company. Two of these scholarships will be filled up in May next, and candidates, who must be British subjects, must send in their applications not later than the last day of April.

* * *

On Tuesday the Lord Chancellor informed the House of Lords that in respect to the Institute of Chemistry Bill the examiners had reported that the standing orders had been complied with. The Bill, which has not yet been issued, now awaits a second reading.

* * *

In addition to the gentlemen whose names were mentioned last week we understand that Mr. Thomas Greenish, of London, has been elected an Honorary Member of the Philadelphia College of Pharmacy, and Dr. Symes, of Liverpool, Mr. Richard Reynolds, of Leeds, and Mr. A. W. Gerrard, of London, have been elected Corresponding Members.

* * *

At the next meeting of the Chemical Society, to be held on Thursday, the 6th inst., the following papers will be read.—"On the Hydrolysis of Sulphocompounds and on the Recovery of Benzenes from their Sulphonic Acids," by Dr. Armstrong and Dr. Miller; a "Note on the Behaviour of the Nitrogen of Coal during Destructive Distillation and a Comparison of the amount of Nitrogen left in Cokes of various Origin," by Mr. Watson Smith; and a "Note on some Experiments to Determine the value of Ensilage as a Milk and Butter-producing Food," by Mr. T. Farrington.

* * *

A meeting of the London Section of the Society of Chemical Industry will be held in the rooms of the Chemical Society, Burlington House, on Monday next, March 3, when papers will be read on—(1) "The Manufacture of Cuprammonium and Zincammonium and their Technical Applications;" (2) "The Filtration of Potable Waters;" (3) "Some Applications of Kieselguhr."

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

February 19, 20, 21 *and* 22, 1884.

Present on each day—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Brady, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Southall, Tanner, Taylor and Thresh.

Dr. Greenhow was present on the 21st on behalf of the Privy Council.

MAJOR EXAMINATION.

19*th.*—*Seven* candidates were examined. *Three* failed. The undermentioned *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Haddock, James .....Bedford Leigh.
Randall, William Joseph..... ...Wareham.
Roberts, Edmund.....Upper Norwood.
Wiggin, John Chinery.....Ipswich.

MINOR EXAMINATION.

19*th.*—*Twenty-four* candidates were examined. *Fourteen* failed. The undermentioned *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Alderton, James .....Leamington.
Arthur, Samuel.....Redruth.
Barnett, William Zachariah ...London.
Bates, John .....Bicester.
Botham, William Bland .....Sheffield.
Broumpton, Frederick Richd...London.
Clarke, Richard .....Ruthin.
Cockerill, Thomas .....Lynn.
Collen, William Cresswell .....London.
Davis, Frederick .....Oundle.

20*th.*—*Twenty-nine* candidates were examined. *Twenty-four* failed. The undermentioned *five* passed, and were declared qualified to be registered as Chemists and Druggists:—

Baker, Sidney George .....High Barnet.
Duckworth, William .....Blackburn.
Farlow, James Southward .....London.
Fellows, Vincent Litchfield ...London.
John, Benjamin .....Narberth.

21*st.*—*Thirty* candidates were examined. *Eighteen* failed. The undermentioned *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Baker, Walter James .....Dorking.
Jackson, Frederick .....Manchester.
Kirby, Herbert Edward.....London.
Leach, John Pickering .....New Shoreham.
Mack, George Henry .....Holt.
Miller, William Henry .....Howden.
Peacock, James, jun. .....Sunderland.
Potter, John Henry.....Nottingham.
Ramsey, William .....Pocklington.
Richards, Thomas Coombs .....London.
Sapsed, William George.....London.
Shallcross, Joseph Richard.....Tunstall.

22*nd.*—*Twenty-seven* candidates were examined. *Seventeen* failed. The undermentioned *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Crowder, Charles Joseph H. ...London.
Jackson, George Granger .....Buxton.
Johnson, Frederick Edward ...Hull.
Sinclair, Matilda Anne ... .Llandudno.
Smith, Samuel Henry.....Leamington.
Southwell, Charles Bullock.....Bridgnorth.
Spratling, Walter.....Boston.
Tupholme, Frank.....London.
Wells, Arthur John.....Leamington.
Wookey, Edgar .....Bristol.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificate of the College of Preceptors.

Strutt, George Henry .....Saltley.

Certificate of the University of London.

Green, Henry Selby .....Penzance.

NORTH BRITISH BRANCH.

EVENING MEETING.

The fourth meeting of the present session was held in the Society's Rooms, 119A, George Street, Edinburgh, on Wednesday evening, February 20, at half-past eight o'clock. Mr. John Nesbit, President of the Branch, in the chair.

The minutes of the former meeting were read and confirmed.

Death of Emeritus-Professor Balfour.

Before proceeding to the business of the evening the President of the Branch said that those present were aware that in the death of Emeritus-Professor Balfour the Society had lost one of its distinguished honorary members. The late professor had in various ways assisted and promoted the work of the Society, and had always shown a kindly interest in the Branch. Most Scotch pharmacists were familiar with Professor Balfour's published writings, and they would join with him in regretting the loss which natural science had received by his death, and in sympathizing with the bereaved family of the professor.

The Secretary to the Branch then intimated the following donations:—

To the Library—

'Year-Book of Pharmacy and Transactions of the Pharmaceutical Conference, 1883.'

From the Committee of Publication.

To the Museum—

Seven specimens of Potassæ Sulphas c. Sulphure.

From Mr. Thomas Maben.

Specimen of the fruit of Alexandrian Senna.

From Messrs. Clark and Pinkerton.

Thanks were accorded to the donors.

A note was then read on—

Tartaline, a Cream of Tartar Substitute.

BY PETER MACEWAN.

My attention has lately been called to a substance which, under the name *Tartaline*, is being sold by grocers as a substitute for cream of tartar, and which from its low price seems to have commanded a ready sale amongst retailers.

The substance comes into the market as a white powder of a strongly acid taste, but devoid of that grittiness which characterizes cream of tartar. When treated with water it behaves similarly to the acid tartrate, adhering to the edge of the vessel and dissolving but slowly in the cold, so that a superficial examination of the substance is apt to convey the idea that it is in some way related to cream of tartar. A more extended examination shows, however, that it is not so. Thus we find that it is completely soluble in a small volume of hot water, the solution formed being intensely acid. A drachm of the substance dissolves in two ounces of cold water in the course of an hour, and this solution by the ordinary tests gives reactions for potash and a trace of iron in combination with sulphuric acid. The powerful acidity of the aqueous solution appeared to indicate that the substance is acid sulphate of potash, and following this indication I found that 0·51 gram of the salt yielded 0·87 gram of barium sulphate = 0·506 gram $KHSO_4$. Another weighed portion lost nothing on exposure in the hot air chamber for an hour. The substance, it thus

appears, is simply the acid sulphate of potash, a salt which, though at one time recognized by the Dublin and Edinburgh Pharmacopœias, is now obsolete as a therapeutic agent. Its introduction by grocers as a substitute for cream of tartar is not calculated to render much benefit to the public, for since it possesses weight for weight, fully 50 per cent. more acidifying power than cream of tartar, its use for baking purposes is not likely to give pleasant results. If the substitution stopped here we might safely leave the public to judge of its suitability for domestic purposes, but there is a probability that ignorant retailers may assume that it possesses medicinal properties similar to cream of tartar, and have no hesitation accordingly in supplying it for medicinal purposes. Viewed in this light, the indiscriminate sale of tartaline assumes a dangerous aspect, while to the pharmacist it illustrates a development of a phase of that competition which he has to contend with at the present time.

A vote of thanks was moved by the President, and after a few remarks on the subject, the next paper, on "The Composition of Potassæ Sulphas c. Sulphure," by Messrs. Maben and Dechan, was read by the Secretary to the Branch. The paper will be found printed on p. 967.

The President of the Branch, in moving a vote of thanks to the authors, said that he had observed the difference in the article as prepared at different temperatures, and had noted that the amount of sulphuretted hydrogen liberated by acids varied with different samples. The authors in directing attention to the cause of this variation had rendered good service, for though the compound had only a limited application, it was but right that it should be uniform in composition.

The motion having been heartily responded to, the President called upon Mr. Patrick Geddes to deliver a lecture on—

The Morphology and Physiology of the Cell.

BY PATRICK GEDDES, F.R.S.E.,

Demonstrator of Botany, Edinburgh University.

Twelve months ago, I was invited to lay before you a statement of the position of my studies of the cell, and at that time I pointed out the importance of the cell theory, and outlined the history and the existing state of the subject. The conception of the organism as composed of unit masses of protoplasm, or cells, is really the deepest generalization in morphology. The cell, however, is usually conceived of as essentially comparable to the common amœba, a gelatinous mass of protoplasm of irregular, constantly changing form. I pointed out, however, that this conception was not sufficient to explain all, or even any fair proportion, of the problems which the study of physiology, vegetable and animal, brings before us. For instance, it does not enable us to form any distinct opinion as to whether plants and animals are really distinguishable, or whether, with Haeckel, we must constitute an intermediate group—the Protista—for the lowest vegetable and animal forms. If we are Darwinians at all we must be thorough-going ones. We need not shrink from pushing the theory to its uttermost limits, and considering whether plants or animals are descended from one or two distinct stocks. Then again, on the same theory we are bound to endeavour to account for the variation, or tendency to variation, in organisms which has given rise to such enormous multitudes of plants and animals. I attempted to show that the difficulties were cleared up by substituting for the conception of the cell as a simple amœboid organism the notion of a "cell-cycle,"*—of a cycle of forms through which the cell is observed to pass in certain of the lowes organisms, hitherto generally regarded as aberrant fungi, the *Myxomycetes*. These most commonly occur as vast irregular masses of protoplasm (like the *Æthalium septicum* of tanyards) flowing here and there and in all sorts of grotesque forms. This irregular slimy mass, or *plasmodium*, is compounded from the union of many amœbæ; after a season of movement in that state, it draws itself together into some definite form, generally into a more or less spiroidal mass, which surrounds itself by a cellulose wall, and thus encrusted, lies for a time perfectly quiescent. After a season, however, the protoplasm breaks up into a number of small, but definite, more or less rounded masses, and these ultimately break loose through an aperture in the wall, and swim out as active ciliated organisms. The little masses of protoplasm swim along by a delicate vibratile thread of protoplasm, by which they propel themselves. This thread acts like a tiny oar and enables the organism to find its way through the water. So that here we have a cycle of four distinct phases, the amœboid being one, and only one, of the four. The four phases are called, the encysted, the ciliated, the amœboid and the plasmodium. Now this restatement of the cell theory proposes to refer the constituent masses of plants and animals not to the amœboid alone, but to some one or all of these four phases through which the cells of the lower organisms tend to cycle.

If time allowed I might show that the various groups of lower plants and animals are all distinctly referable to this one series of forms. For instance, simple microscopic plants, like *Protococcus*, which of course are provided with cellulose walls, are very often in the habit of leaving their wall and issuing in the ciliated state, and then settling down again. In the same way a great many of the microscopic animals exhibit more or less of these phases. For instance, the monads which one finds in putrefying infusions are typically ciliated, but their life-history has recently been investigated, and it has been shown that these creatures fall down into an irregular amœboid state, and subsequently encyst themselves. So that, if time allowed, I might justify the proposition that the lower plants and the lower animals are referable to this simple primitive type of the *Myxomycetes*. This diagram expresses the matter in a clearer way. There is a myxomycete; here encysted, here ciliated, here amœboid, and here plasmodium. A bacterium, of which one hears so much, exhibits an alternation between the encysted and the ciliated state. Then again, an ovum or egg-cell corresponds at first to the amœboid state, and later to the encysted. So in this way one gets a conception of plants and animals being much more closely related in cellular structure than is commonly assumed. One regards, in fact, the lower plants and animals, and of course the higher plants and animals also, as being specialized from a form of which this cycle affords us a tolerably distinct idea. I might go on to show that the cells in the higher animals exhibit the same cycle; that, for instance, a blood corpuscle of a sea-urchin, or probably also the diseased cells of higher animals, run through a cycle of the same kind

That, then, is a very rudimentary outline of the theory which underlies the present paper. I propose going on to discuss the problem of the cell structure. What is the internal structure of the cell, and what is the explanation of that very remarkable phenomenon of contractility which protoplasm constantly exhibits? Great attention has lately been paid to this question, but there are still some problems to settle; let us consider some of these. The lowest amœboid forms are simply granular masses of protoplasm of quite irregular shape, and tolerately homogeneous. If you look at higher amœbæ on the other hand, you find that they exhibit a granular interior, and a clear pellucid exterior in which no granules are visible. Again, organisms like the Foraminifera are provided with thread-like, granular and reticulated processes from their protoplasm. On the other hand in forms like the Radio-

* Geddes, 'Proc. Roy. Soc. Edin.,' 1883-4, "A Restatement of the Cell Theory."

laria the processes instead of being granular are perfectly clear and transparent, instead of uniting with each other they remain perfectly distinct, instead of moving and flowing they remain perfectly quiescent. How is that to be explained? As yet no theory affords any ground of explanation.

Again, there are remarkable changes visible in eggs of all kinds of animals before fertilization and during it, and similar remarkable phenomena when cell division is going on. Are these granules I am speaking of really separate grains of denser matter, or the expression of the intersections of a net-work of denser protoplasm? Questions of this kind are at present being hotly debated among histologists. Then again, one of the most difficult problems, one indeed which has been discussed during the last thirty or forty years, is the problem of muscular contraction. No two histologists are agreed about it; an enormous mass of literature has been accumulated, and as yet with comparatively little result, and comparatively little unity of opinion. One cannot always be sure whether the muscle fibres of the lower animals are striped or unstriped. Then again, another series of problems which the investigator must face is that which was raised by Mr. Darwin.* Mr. Darwin put the living cells of the tentacle of the sun-dew under the microscope, and watched what was going on within their delicate cellulose walls. He showed that within this cell, when it was digesting, or when he treated it with some reagent like my dilute solution of carbonate of ammonia, or when he applied heat or electricity, the protoplasm broke up, separated into two distinct substances, one of them remaining very much the same as before, the other forming all sorts of irregular drops, granules and threads, constantly changing and flowing together.

Now, I have gone over a number of difficult questions, the structure of amœba, the question why foraminifera possessed delicate filaments of protoplasm which are granular and moving, while the radiolarians possessed stiff and non-granular threads; the question of the structure of muscle and the question of aggregation. The hypothesis by which I propose to explain and unite all these phenomena is that of extending the conception of aggregation from the vegetable cell to the cell generally. Why should not the granules be simply the expression of the same change which is going on in the insectivorous plant? Why should not protoplasm, in fact, be separating itself into the same two substances which we have there? In the same way the processes of the foraminifera, which are granular, are so because they are aggregating. In the granular interior of the amœba this process is going on; in the clear exterior not so, and therefore the protoplasm remains clear and simple. Let us see what more this conception will do for us. In the first place it suggests,—setting out from these researches of Mr. Darwin—an investigation as to what changes chemical substances produce upon cells. That of course is something which touches upon the general questions of therapeutics and pharmacy in the most direct way.

The question of applying chemical reagents to living cells is, of course, the essence of the whole affair. Now carbonate of ammonia is not all the Pharmacopœia, but it is a substance which yields most striking results when applied to the living cell. For instance, if you apply it to the sun animalcule you will notice the most curious change. The creature actually tumbles down and dies in a few minutes, losing its complex protoplasmic structure, and collapsing into a simple amœba before it breaks up. Well, what is to prevent anyone from applying a whole series of reagents, carbonate of ammonia, alkaloids, different salts and so on, to various organisms; not only to protozoa, but to the simpler plants; not only to the lower organisms, but also to the cells of higher organisms? I have no doubt, for instance, that such reagents would produce a noticeable effect upon the epidermic cells of tadpoles. One could so begin to get some approximation of the therapeutic effects of reagents upon the cells of invertebrates themselves, an investigation which might carry us far. And, again, if time allowed, I might go on to show how this explanation fitted and met various problems, such as those which I have sketched out. Take that of muscular structure alone. If we magnify muscular fibre enormously we see that the fibrils are made up of strongly refracting portions, alternating with clearer spaces, in which dots or granules occur. Some observers say that they do not find these granules. Very good: they observed it when it was in a certain state of contraction.* Others find that the ends have come together and united: they observed it in a state of more complete contraction, and so on. Now that is thoroughly in unison with the conception of aggregation in the vegetable cell; we have a cell which separates into two kinds of protoplasm and nothing more. The union and change of rods and granules are simply the union and change which we observe in the insectivorous plant. This is rendered regular by the definite limit of the fibrils. I might develop this hypothesis, a hypothesis which, on the whole, explains the facts, but which does not as yet of course lay claim to any authoritative verification. I should be very sorry if you understood me to assert that this was demonstrated fact. I offer it simply as a hypothesis. Notice, however, one of the explanations which it affords us. Long ago it was pointed out, by Mr. Herbert Spencer for instance, that we have as yet no clue to the mode in which molecular movement is converted into the movement of masses. By what change is it that the whole fore-arm can be elevated in this way by the use of the biceps muscle? How is it that the multitude of little molecular movements are added up to the large movement of the mass? No explanation is forthcoming on any view but this. If these masses of protoplasms are elongated, they tried to shorten and broaden and draw themselves into a sphere. If all these multitudinous elements of the muscle are drawing themselves towards the spherical form, are shortening and broadening, then of course you have an explanation of that general shortening and broadening which takes place in the contraction of the muscle. In the same way, if we have a drop of oil suspended in the water and it draws together into a sphere, it overcomes a slight resistance, it pushes aside the particles of water which surround it. The same thing will account then for the overcoming of resistance of masses; a muscle is able to lift a weight, because the sum of thousands of millions, perhaps, of elements all contracting and pulling together make up a power which overcomes this large resistance. And so molecular movement is converted into movement of masses; the overcoming of minute resistance is converted into the overcoming of a large mass resistance.

Now, one question more. Why should there be two protoplasms? How is it that if you treat protoplasm with a reagent it breaks itself up into two substances? I do not see how it is possible to explain that; it is an observed fact. I would be glad if any member of the Society would enlighten me on this point; could indicate any parallel case in inorganic or organic substances, where a chemical change separates a substance at first homogeneous into two distinct substances which afterwards reunite into its components, or in which an electric current temporarily segregates a complex mixture. I am not aware that any parallel case exists, but we know that it would be very important if something analogous could be found. This is therefore suggested as a problem, without any solution being offered. But let me just point out one interesting corollary from the general notion of cellular therapeutics. Let me start again with an observed

* 'Insectivorous Plants.' London: 1875. Article, "Insect. Plts.," 'Encyclop. Brit.'

* See Professor Rutherford's recent paper. 'Trans. Roy. Soc. Edin.,' 1883.

fact. When amœboid cells unite into a vast compound amœba, there is visible an extraordinary intensification of the activity of the mass, that is to say, when the little amœbæ, a hundred or two of them together, are united into a single compound mass they throw out extraordinarily long processes; they career about under the field of the microscope, sending out filaments of protoplasm enormously longer than any amœba can do. What one amœba cannot do, the union of many amœbæ does in a most striking manner. Why is this? Why should the union of many amœbæ produce such activity? It seems to me that these numerous amœbæ, when they flow together, serve as it were as food to one another, the protoplasm of one is poured into that of others, the waste products, the surplus water and so on, are squeezed out, and in this way we get a vast composite amœba of which the activities are summed up from its components. But more than that we saw how carbonate of ammonia was powerfully stimulating to protoplasm, and Mr. Darwin's researches have shown that alkaloids and waste products are excessively stimulating, and set up the most extraordinary aggregation, so that a poison, for instance, sets up too much of this movement of aggregation in the protoplasm. There, then, is actually a use, not only for the protoplasm, but also for the waste products, the waste product of one cell acts as a stimulant when it unites with the protoplasm of another. So, for instance, one may speculate that the store of alkaloid in a coffee bean is used to stimulate the protoplasm of the germinating plant. We may apply this notion of conjunction of cells to the union of the ovum and spermatazoon in fertilization; we may imagine, and we are reasonably entitled to do so, that the spermatazoon brings not simply an additional mass of protoplasm, but brings something of distinctly different chemical properties, differing perhaps by possessing substances especially stimulating to the vast mass of protoplasm of the ovum.

So far, of course, these considerations are speculative, but before a Society of this kind I think it not illegitimate to call attention to these speculations in cellular chemistry and cellular therapeutics.

The lecturer frequently referred to large coloured diagrams in illustration of different statements, and also rendered the discourse of greater interest by means of extempore drawings.

Mr. H. Bellyse Baildon, in proposing a vote of thanks, said that he had attended a great many evening meetings, but he did not think that he had ever listened with more rapt attention than he did to Mr. Geddes's interesting lecture. He thought that it had a special value in so far as it not only gave the issue of a number of most interesting results of his own, but it pointed out to others a most valuable field for research. The suggestions regarding the effect of chemicals upon cellular tissue of various kinds was most valuable, and skilled microscopists would not fail to obtain good results in carrying out the suggestion. The manner in which the lecturer was received was a sufficient proof of the interest attached to the subject, and this, he felt, was due to Mr. Geddies's wide generalizations, which, while suggestive, gave great interest and stimulus on the study of the subject.

Mr. Napier seconded the motion, which was heartily responded to, and in the course of reply—

Mr. Geddes stated that he thought that skilled pharmacists might conduct some of the researches which he had indicated; they would not require continuous observation, but only frequent glances of attention during several hours. The interest of the admission of a drug did not at all stop when it was conveyed to the stomach, but really began then. The question was how did these drugs affect the cells of the organism? It was really possible to investigate this by means of the microscope, and by applying solutions of proper strength to microscopic organisms or to tissues of animals.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The annual meeting was held on Friday, February 22, at the Museum and Library, Queen's Road; Mr. G. F. Schacht, President, occupied the chair.

The report of the Council and the statement of accounts were received and adopted.

The following gentlemen were elected to serve as members of the Council for the ensuing year, namely—Messrs. Allen, Berry, Pitman, Schacht, Stroud, Warren, White and Wretts.

The Chairman congratulated the incoming Council upon the slight numerical increase upon the lists, both of the members and of the associates of the Society. He was also very glad to hear from his friend, Mr. Warren, who took such anxious care of the Library, that the books were so much read and studied. He hoped when the new Council had fully constituted itself, some good useful scheme for still further developing the benefits of the Association would be arrived at.

DOVER CHEMISTS' ASSOCIATION.

At the quarterly meeting of the Dover Chemists' Association, held on the 21st of February, the following paper was read—

Peroxide of Hydrogen,

its actual strength as found in commerce.

BY J. F. BROWN.

The increasing use of this chemical and its wide variations in price, led me to conclude that a simple test of its quality might be found useful.

The method I propose, is to make its capacity for raising a ferrous salt to the ferric state the measure of its value, thus $2FeSO_4 + O + H_2SO_4 = Fe_2 3SO_4 + H_2O$, showing that 112 parts of iron require 16 parts of oxygen to bring about the change of state.

Pure unoxidized sulphate of iron would answer the same purpose using 278 parts, and I duplicated some of my testings in this way—without finding any discrepancy, but perhaps the employment of bright polished iron wire is, on the whole, to be recommended in preference.

As a convenient quantity, 44·8 grains of the latter were dissolved by a gentle heat in 15 fl. drs. diluted sulphuric acid in a glass flask lightly stopped with a pledget of cotton to prevent undue access of air; the cooled solution was carefully diluted to 5 fl. oz., transferred to a stoppered bottle and used as quickly as possible.

Five fl. drs. indicating $\frac{8}{10}$ths of a grain of oxygen formed the unit employed, and into this quantity the sample of peroxide to be tested was dropped from a burette until, after brisk stirring, it ceased to strike a blue colour with a drop of freshly made solution of red prussiate of potash.

The quantity used was then noted and the results are thus tabulated:—

Sample	A . .	101	grain measures	employed.
,,	B . .	92	,,	,,
,,	C . .	121	,,	,,
,,	D . .	1500	,,	,,
,,	F . .	93	,,	,,
,,	G . .	87	,,	,,
,,	H . .	80	,,	,,
,,	I . .	93	,,	,,
,,	J . .	42	,,	,,
,,	K . .	226	,,	,,

Temperature 58° Fahr. Barometer 30 inches. Since a cubic inch of oxygen weighs ·3422 grain as compared with 252·45 grains, the weight of a cubic inch of water, $\frac{8}{10}$ths of a grain will occupy nearly 590 grain measures, and the actual volume strengths will be obtained by

dividing 590 by the number of grain measures used in each case, thus: —

A	contained	5·8	volumes.
B	„	6·4	„
C	„	4·8	„
D	„	·4	„
F	„	6·3	„
G	„	6·8	„
H	„	7·37	„
I	„	6·3	„
J	„	14·	„
K	„	2·57	„

Samples A and B were supplied as 10 vols. in the ordinary course of business.

C was old stock and turbid, only just enough being drained out to test with.

D was taken from a freshly opened bottle, supplied by the same wholesale house as A, but was inconceivably weak.

F was obtained for the purpose of testing from the firm who claim priority in introducing this article.

G and H were sent as samples by a leading firm of wholesale druggists as 10 volumes and 20 volumes respectively.

So also were I and J, and the latter was the only sample approaching even remotely, the double strength.

K had, I think, been kept some time.

I would only add that this paper had been projected and worked out before the publication in the Journal of two recent communications on the same subject.

HAWICK PHARMACEUTICAL ASSOCIATION.

The usual monthly meeting was held on Tuesday, February 12, when there was a fair attendance, Mr. Maben, Hon. President, occupying the chair.

The subject under consideration was, "Whether Coated Pills ought to be supplied to the Public."

Mr. J. A. Hislop, in opening the discussion, said that it was perfectly inexcusable to coat pills in order to hide defects arising from bad manipulation, and that it was unnecessary to coat them to cover their nauseous taste, as uncoated pills, after a lapse of twenty-four hours, acquire a hardened exterior, which keeps the taste from being felt for a much longer period than is required to swallow them. He had no objection to coating where this was used to prevent the solution of the pill till it reached the intestines; but where all pills are coated this exception in most cases becomes the rule. Coating is sometimes employed to prevent oxidation or volatilization of active ingredients, but pills of this class should be made when required. Lastly, coating is not sanctioned by authority, therefore should not be used unless specially desired. Mr. Hislop then detailed the results of a series of experiments with uncoated and coated pills, from which it appeared that the latter invariably required much the longer time before complete disintegration took place.

In stating the other side of the question, Mr. J. Craig, jun., said that coated pills keep soft much longer than uncoated pills, because the coating prevents the moisture from evaporating. This is especially desirable in such pills as pil. assaf. co., which if once allowed to harden would pass through the stomach unaltered. It would be wrong to use insoluble varnishes for coating, but pills can be coated so as to be perfectly soluble. Pills containing essential oils or camphor must of necessity be coated to prevent them losing their virtue, and many other pills require coating, otherwise the active ingredient would be oxidized. Then it was desirable to make pills as agreeable to the eye and as tasteless as possible, so that the tendency to nausea in invalids and others who have a difficulty in swallowing pills may be averted, but without coating this could not be done.

In the discussion that followed all present took part, and various opinions were expressed. One member stated that he knew a case where a youth took no fewer than six coated colocynth pills within twelve hours without the slightest effect being produced. The feeling of the meeting was that in some cases coating was necessary, and where not essential it was no disadvantage provided a readily soluble and harmless coating could be obtained. The experience of several members was, however, that the coated pills of commerce were often very unsatisfactory.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, February 21, Dr. W. H. Perkin, President, in the chair.

The following certificates were read for the first time:—H. Cave, F. W. Fleming, E. E. Graves, A. E. Lewis, S. Smith.

During the evening a ballot was held and the following gentlemen were declared by the scrutators, Drs. Wright and Hodgkinson, duly elected Fellows:—L. Archbutt, J. H. Burlans, D. Bain, W. H. Barr, R. A. Bush, P. S. Chantrell, A. F. Damon, H. C. Draper, T. R. Duggan, V. Edwards, W. T. H. Elsley, G. W. Gibson, F. W. Harris, T. Hilditch, R. E. Moyle, P. Morton, W. J. Orsman, F. R. Power, A. E. Simpson, C. W. Sutton, H. G. Shaw, E. F. Smith, F. W. Tompson, A. Tarn, E. W. Voelecker.

It was announced that the following changes in the Vice-Presidents and Council were proposed:—Vice-Presidents, Drs. T. E. Thorpe and W. Weldon, nominated instead of Dr. Crum Brown and Professor Emerson Reynolds, who retire; Council, Drs. Carnelly and Messel, R. J. Friswell and M. Carteighe, nominated in place of Captain Abney, Dr. Mills, Professor McLeod and G. H. Makins. Dr. Hodgkinson, Dr. Thorne and F. W. Toms were appointed Auditors.

The following paper was then read by Dr. Gilbert—

On the Composition of the Ash of Wheat, Grain and Straw grown at Rothamsted in different seasons and by different manures. By Sir J. P. Lawes and Dr. J. H. Gilbert.—This paper gives an account, including duplicates, of two hundred and fifty-three analyses, most of which were made by R. Richter, of Berlin. The ashes were prepared at Rothamsted, being burnt in oblong platinum dishes by surface heat in order to prevent, as far as possible, any fusion. Every ash is of produce of known history of growth as to soil, season and manuring. The experiments are arranged in three series. The first illustrates the influence of fluctuation of season from year to year, under three known, but very different, conditions as to manuring, during sixteen consecutive seasons. The second shows the influence of four characteristic seasons, two favourable and two unfavourable, under nine different conditions as to manuring. The third demonstrates the influence of continuous exhaustion or supply of certain constituents as it represents the proportionally mixed produce for the ten years 1852–61 and the ten years 1862–71 from ten differently manured plots. In the first series the three plots were respectively (1) unmanured; (2) treated with 14 tons farmyard manure per acre; (3) treated with about 200 pounds of ammonium sulphate and 200 pounds of ammonium chloride per acre annually. The principal points of interest in the analyses are the relative quantities of potash and phosphoric acid. The chief conclusions are—that with normal maturation the grain is of nearly uniform composition whatever the manure, that the deviations from normal mineral composition are associated with deviations from normal development of the organic substance, and that the season has much more influence on the mineral composition of the grain than the manure. An obvious difference can nevertheless be detected in the average composition of the grain under the different conditions as to manuring. Thus the grain grown by ammo-

nium salts alone shows exhaustion of potash, and especially of phosphoric acid. In the second series of analyses the following four seasons were selected: 1852, bad both as to quantity and quality of produce; 1856, quantity fair, but quality indifferent; 1858, quantity moderate, quality above the average; 1863, good as to quantity and quality, As to manuring the conditions were unmanured; farmyard manure had ammonium salts alone; ammonium salts and superphosphate; ammonium salts, superphosphate and soda salt; ammonium salts, superphosphate and potash salt; ammonium salts, superphosphate and magnesia salt; and, finally, a mixture of the last three. In the third series of analyses the manures employed were almost the same as those used in the second series, but the analyses relate to a period of twenty consecutive years. The results confirm those obtained in series I. and II. It is seen that the amount of mineral constituents taken up by the plant over a given area depends very directly on the amounts in available condition within the soil and that while the quantity stored in the grain is nearly uniform, the amounts remaining in the straw have a very obvious connection with the supply or exhaustion in the soil. The influence of season is also well marked. The composition of the grain, as to its mineral constituents, seems only to vary with the manure when there is a very abnormal deficiency of one or more constituents, having regard to the amount of growth which is induced by the liberal supply of others. The paper is very lengthy (over 70 pages), and contains eighteen tables of analyses. The authors promise in a future communication to give a similar series of analyses of ashes from barley, leguminous crops, root crops, potatoes, and the mixed herbage from grass land.

The President complimented Dr. Gilbert on the lucidity with which he had communicated the paper; it seemed to him a most interesting fact brought out by this remarkable series of ash determinations, that the composition of the grain should be so uniform.

Mr. T. Farrington gave an instance of the importance of the season with reference to the action of manure with potatoes. In a wet season the addition of kainit was without beneficial influence on the crop, but in a dry season its use was found to be very beneficial; he had also noticed that nitrates had at first more effect than ammonium salts in promoting growth.

Mr. Lloyd was much impressed with the fact that the mineral constituents in a poor crop were relatively larger than in a good crop. The roots probably gathered the mineral constituents independently of the season, and so if the weather was bad and the organic constituents were not formed, the amount of mineral matter would be apparently increased. As the straw seemed to vary more or less with the manure applied, an analysis of the straw ash might perhaps serve as an index of the mineral constituents wanting in the soil.

Dr. Gilbert said that at present it would be difficult to differentiate the mineral constituents of the straw ash. There was no doubt that in bad seasons the maturation of the grain was sluggish and the starch formation was imperfect, and so the percentage of mineral matter was raised.

On the Analysis of Shotley Bridge Spa Water. By H. Peile.—Apparently only one analysis, and that incorrect, has been made of this water. The author has obtained the following numbers indicating grams per litre:—Barium chloride, 0·0569, ammonium chloride, 0·0042, calcium chloride, ·2632, magnesium chloride, 0·0437, lithium chloride, 0·0565, potassium chloride, 0·0513, sodium chloride, 1·7333, calcium bicarbonate, 0·3964, ferrous bicarbonate, 0·0155, magnesium bromide, 0·0075, traces of magnesium bicarbonate and iodide, manganous bicarbonate, silica, phosphates, albumenoid ammonia. The water tastes strongly of iron.

The Society then adjourned to March 6, when a paper by Drs. Armstrong and Miller, "On the Hydrolysis of Sulpho Compounds" will be read.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association, held on Wednesday, February 13, Mr. Parkinson (President), in the chair, a paper on the "Human Eye" was read by W. J. Frankish, M.R.C.S.E.

The lecturer divided his subject into sections. He drew attention to the orbit, the strength of its margins and how well it preserved the eye from injury, as witnessed by the number of persons who at some time in their life have been wounded or contused in the region of the eye, without that organ being injured. How useful and necessary are the eyelids, which by their action are continually wiping off the particles of dust which settle on the cornea, was demonstrated. By means of diagrams he illustrated the cause of long and short sightedness, and showed the action of the muscles which move the eye. The lecturer also by the use of diagrams showed the action of the lachrymal gland, its position, etc., and how the tears are carried off. In explaining the anatomy of the eye the author compared it with the photographic camera and showed the superiority of the eye over any mechanical apparatus by its adaptability to any distance and to any sized picture. There was not time to enter into the phenomena of vision and illusions of sight.

A long discussion followed, in which the President, Messrs. Braithwaite, Burnett, Glew, Hartridge, Parker and Millhouse took part, after which a cordial vote of thanks to Mr. Frankish for his valuable and interesting paper was proposed by Mr. Parker and seconded by Mr. Millhouse, and carried unanimously.

Mr. Frankish having replied, the meeting was adjourned.

Parliamentary and Law Proceedings.

Prosecution under the 17th Section of the Pharmacy Act.

At the Oldham Police Court, on Wednesday, John Wood, 125, Manchester Street, was summoned for illegally selling poisons.

The summons was taken out by Alfred S. Wright, the Assistant Secretary of the Chemists and Druggists' Trade Association of Great Britain. Mr. Porter (Glaisyer and Porter, solicitors, Birmingham) was for the prosecution, and Mr. Hodgkinson for the defence.

Mr. Porter said the summons was taken out under the 17th section, 31 and 32 Victoria, chapter 131, entitled An Act to Regulate the Sale of Poisons, which stated that it was unlawful to sell poisons, wholesale or retail, unless the box, bottle, or vessel, in which such poison was contained was distinctly labelled "poison," with the name and address of the seller, and the name of the poison, and any person convicted under the Act was liable to a penalty not exceeding £5 for the first, and £10 for the second and each subsequent case. The facts of the case were as follow:—On the 14th inst. the Assistant Secretary, from representations made to him, came to Oldham, and went to defendant's shop, and among other things asked for a pennyworth of oxalic acid, which was supplied in a packet, which bore a label on which was the word "poison," but neither the seller's name, or the name of the poison. The case was of great importance to the public, as scarcely a paper could be taken up that did not contain an account of some case of accidental poisoning, in consequence in many cases of the poisons being insufficiently labelled. The object of bringing the case before the public was to show reckless traders that they could not controvert the Act of Parliament in this manner.

Alfred Wright, Assistant Secretary of the Chemists and Druggists' Association of Great Britain, stated that on the 14th inst. he went to 125, Manchester Street, the name over the window being "Wood." He went into the shop and asked for a pennyworth of oxalic acid, and one or two other things. It was handed to him in the

packet produced, which had on simply the word "Poison," without the name and address of the seller or the name of the particular poison. The packet was in the same state as when purchased, excepting that a portion had been taken out for analysis.

Mr. Hodgkinson: Is that poison?

Mr. Porter: Most decidedly.

Mr. Hodgkinson: You have not proved it.

The Complainant, cross examined by Mr. Hodgkinson, said: I went into other shops in Oldham, but have not taken out any other summonses. I first asked for a quarter of a pound of linseed meal, then for two pennyworth of laudanum. He supplied the linseed meal, but said he did not keep laudanum. I asked for a pennyworth of rottenstone. That was not poison. I asked for a pennyworth of oxalic acid. He did not say he would not supply it. The defendant remarked, "You must be careful with it; it is poison." I said "I know it." He did not say he was a wholesale dealer, and that he supplied it only in large quantities to wholesale dealers. I have not been prejudiced by the purchase. I do not believe that anyone has been prejudiced by the purchase. The defendant asked if the oxalic acid was for cleaning harness. I said it was for cleaning brass.

Joseph Pendleton, poor-rate collector, said the rates for the premises were paid by the defendant.

Mr. Hodgkinson characterized the prosecution as paltry, and said the complainant went into the shop for the purpose of trapping the defendant. He said he would call the defendant.

The Clerk: He cannot be called, as it is a criminal offence.

Mr. Hodgkinson: It was allowed in O'Donnell's case.

The Clerk: It was a favour; not a right.

Mr. Hodgkinson said he would withdraw from the case, so that the defendant might make his own statement.

The defendant then said that he informed the complainant that he did not sell oxalic acid except by wholesale. The complainant asked for a small quantity for the purpose of cleaning taps. He (defendant) was in a hurry to catch a train, and he put a small quantity in a piece of paper, attaching the word "Poison." He received a penny for the poison produced.

The Bench inflicted a fine of £1, with the ordinary court costs.

Mr. Porter asked for extra costs, observing that the proceedings were taken for the benefit of the public. There had been a couple of journeys by the Assistant Secretary to Oldham, and extra expense for a solicitor's fees. They heard that in Oldham there had been a lot of illegal trading going on.

Mr. Hodgkinson said the Bench had already done that which would meet the justice of the case, considering the circumstances under which the poison was obtained—under false pretences.

Mr. Porter objected to the latter statement.

The Bench: Obtained for the purpose of the prosecution. They declined to alter their decision.—*Oldham Daily Standard.*

Poisoning by Chloral Hydrate in an Infirmary.

An inquest was held at the Gloucester Infirmary on Tuesday afternoon on the body of Anne Frost, who died very suddenly on the previous Friday. The house surgeon stated that Dr. Washbourn, senior physician, prescribed for deceased a sleeping draught. The mixture was to contain syrup of chloral hydrate, and each draught to contain 1 drachm. In such a dose there would be 10 grains of chloral hydrate. The prescription was dictated by Dr. Washbourn and taken down by Mr. Ancrum, who left out the word "syrup." The difference in the amount of chloral hydrate is 60 grains instead of ten. The prescription as taken down by Mr. Ancrum was evidently a mistake. Mr. Ancrum had been a pupil at the infirmary six or seven months The woman died a quarter of an hour after the dose. He should consider she died from syncope, brought about by the draught administered and the condition of her heart and lungs. The draught contained chloral hydrate 1 drachm, instead of syrup of chloral hydrate 1 drachm. Mr. A. P. Carter, surgeon, practising in Gloucester, said such a dose, in his opinion, would be almost certain to cause death. The inquest was resumed yesterday, and other evidence having been taken, the Jury, after an hour's consultation, returned a verdict "That deceased came to her death owing to the administration to her by mistake at the infirmary of an excessive dose of chloral hydrate," and expressed their opinion that the system disclosed by the inquiry as existing at the infirmary, with reference to the dictating of prescriptions without any signature of a responsible medical officer being appended, was a very dangerous one, and one which ought to be remedied.—*Times.*

LIST OF SUBSCRIPTIONS TO THE BENEVOLENT FUND.

Under Harrogate, p. 686, *insert*—
Reynolds, Freshfield . . . . . £0 10*s.* 6*d.*
Under Manchester, p. 691, *for*—
Ashford, R. . . . . £0 5*s.* 0*d.*
read—
Ashworth, R. . . . . £0 5*s.* 0*d.*

Correspondence.

The Benevolent Fund.

Sir,—I was pleased to see in last Saturday's Journal the "Local List of Subscribers to the Benevolent Fund," which should stimulate all our local secretaries to a renewed exertion on its behalf,—for even chemists are not exempt from the levelling process now going on, and it is not impossible that many who now do what they can to support the Fund may by adverse circumstances be led to seek its aid. Thence the necessity for a material increase in the number of subscribers. It is not cheering or satisfactory to see so many places of considerable importance raising scarcely the conventional guinea, among all the chemists and their assistants. The latter class seem to be overlooked to a large extent, although many would be pleased to show their sympathy with the aged and helpless of our brethren; whilst many of the former must be forgetful, indifferent, or perhaps have not been solicited. At all events an appeal throughout the country (not as a special effort merely, but) to permanently increase the annual subscriptions would be the means of making some cheerless homes somewhat brighter and the last years of not a few somewhat more comfortable, whilst the personal sacrifice, as an annual subscription, would not be great.

I hope that this suggestion may be of some use in the interest of the "Fund."

Southampton. A Country Pharmacist.

W. G. Davies.—The specific gravity of the U.S.P. "lactic acid" is 1·212, and that of the P.G. 1·21 to 1·22. See before, p. 82.

A. Sibbit.—In the State of New York the practice of pharmacy is regulated by restrictive legislation, and we believe also in both the other States mentioned by you.

F. Walder.—Schellen's 'Spectrum Analysis,' translated by Huggins (Longmans).

Mars.—We presume that it is intended that such a provision shall be made.

F. E.—The correspondence referred to may be found in vol. vi. of the present series, pp. 678, 738, 758.

J. C. Lloyd.—The papers have not, so far as we are aware, been reprinted in a separate form.

A. K. F.—At present an answer to your question would partake of the nature of a prophecy, though we do not doubt that a satisfactory arrangement will be made.

Communications, Letters, etc., have been received from Messrs. Cross, Martin, Wyley, T. and H. Smith, Stanton, Wilkinson, Hart, Newsam, Country Chemist, Nux Vomica, Salinc.

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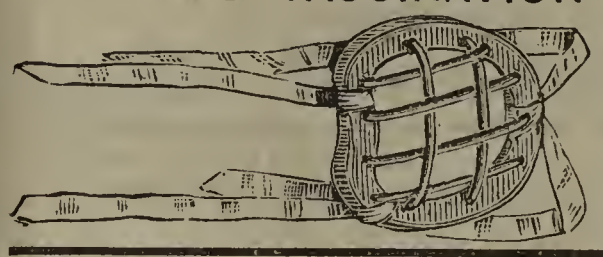

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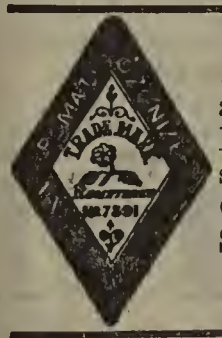

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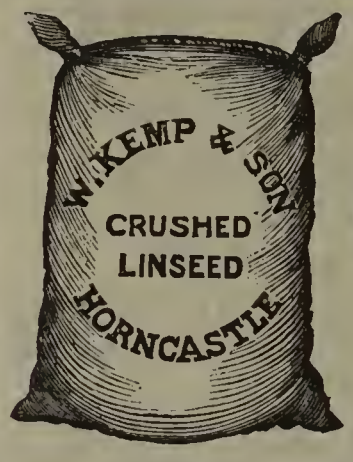

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AS ASSISTANT, in good Dispensing business, in London. Age 22. Passed Minor. London experience. J. Mr. Havard, Narberth, S. Wales.

ASSISTANT. Age 25 years. Height 5ft. 6in. Experience, 8 years in Family and Dispensing business. Minor qualification. Now disengaged. CHEMICUS, 148, East India Dock Rd., Poplar.

AS JUNIOR, in good Dispensing business. Age 21, Height 5ft. 10in. 5½ years' experience. A. CLARKE. 3, Cambridge St., Bridlington.

AS MANAGER, by a Pharmaceutical Chemist and Dentist, with first-class experience and highest references. Open to a temporary engagement. BETA, 1, Catherine Villas, Alexandra Rd., Windsor.

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EVENING employment with Chemist or Surgeon. Would take unfurnished apartments in lieu of salary. Good general experience. BONUS, Mr. Freeman, 11, Wilson St., Finsbury, E.C.

BY business man, unqualified, as SENIOR or MANAGER. 11 years' experience (London and country). Good address, sober, energetic, and competent. Good references. F. J., 30, Graham St., Eaton Sq., S.W.

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RE-ENGAGEMENT as MANAGER. Married, no family. 20 years' London and provincial experience. Competent Dispenser and Prescriber. Qualified by exam. Permanency. A. P. S., 33, South St., Dorking, Surrey.

AS Chemist's ASSISTANT or Surgeon's DISPENSER. Age 31 years. Height 5ft. 8in. 15 years' experience. Good references can be given. C. C. F., 1, Westbourne Ter., Cheltenham.

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BY advertiser, aged 21, in good class business, at once. Good references. Height 5ft. 9in. J. M. TAYLOR, Hoyland, Barnsley, Yorks.

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February 27th, 1884.

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LONDON, 1884.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 715.] SATURDAY, MARCH 8, 1884. [PRICE FOURPENCE

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Candidates will receive notice of the date on which they will be required to present themselves.

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EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

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The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on April 2nd should be forwarded to the Secretary not later than Wednesday, the 26th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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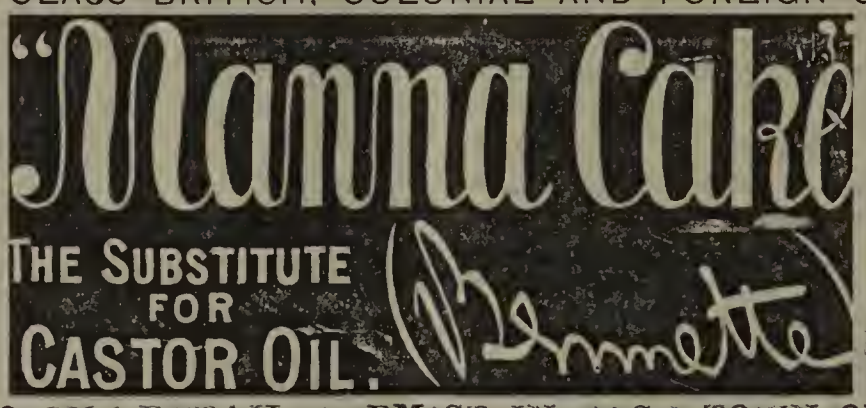

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The only brand warranted genuine by Baron Liebig.

CAUTION.—Numerous inferior and low-priced substitutes being in the market with misleading titles, labels and portraits of the late Baron Liebig, purchasers must insist upon having the Liebig Company's Extract of Meat.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

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7 lb. Tins	per lb.	5/11	each	41/5
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½ lb. Jars	,,	6/4	,,	38/0
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2 oz. Jars	,,	7/0	,,	10/6
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Best Quality. No Oil Extracted. Carefully Cleaned and Ground, so as to retain the natural colour of the seed without being heated.

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Spiritus Ætheris Nitrosi

Guaranteed to contain the proportion of Nitrous Ether directed by the British Pharmacopœia.

Æther Nitrosus and Sol. Ætheris Nitrosi

Respectively 8 and 4 times the strength of the Spirit.

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Distilled from Volcanic Ammonia.

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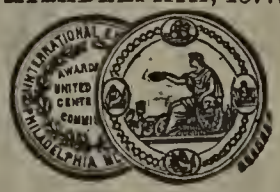
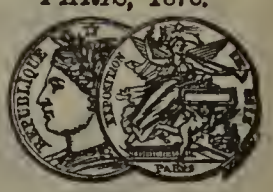


PARIS, 1878.



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The Original Preparation, as approved by the Medical Profession on account of its known composition and uniform strength.

Retail at 13½d., 2s. 9d. & 4s. 6d. Dispensing, 4 ozs., 4s. 6d. & 10 ozs. 11s. stamped.

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Bills with name on application with instructions for forwarding.

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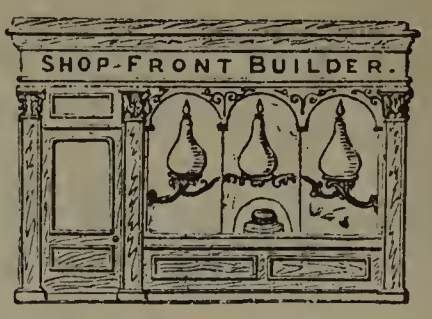

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„ John Broad, Rise House, Hornsey Rise, N.		„ Thomas Hall, Lowestoft.
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SELTZER ..	11/-	Hpr.,	25 bots.
,, ..	15/-	Hpr.,	50 ½-bots.
PULLNA ..	18/-	Case,	20 bots.
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VICHY ..	31/-	,,	50 bots.
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CARLSBAD ..	37/-	,,	50 bots.
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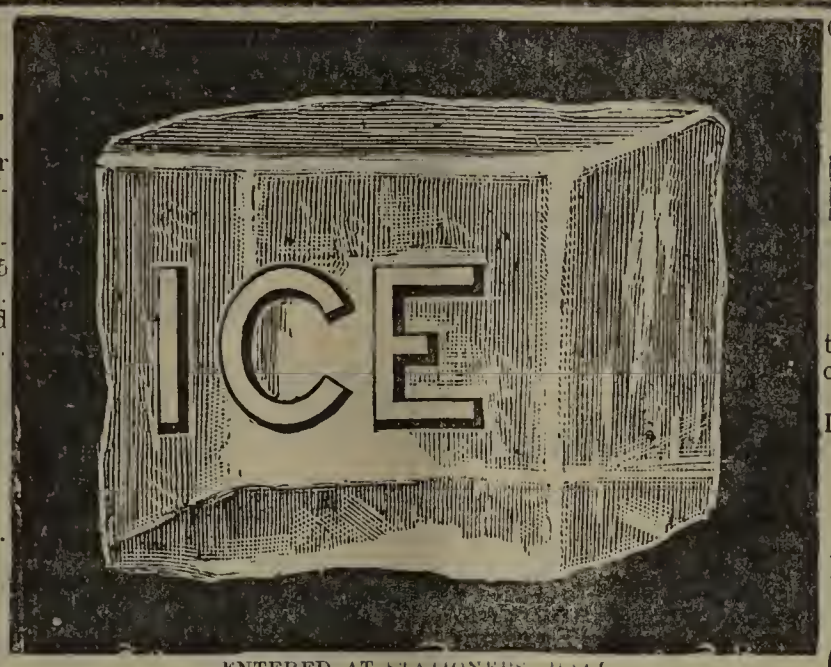
HOMBURG ..	40/-	,,	50 ,,
WILDUNGEN	43/-	,,	50 ,,



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THE NEW BLACK INK, different from anything else ever produced.

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It writes almost instantly Full Black.
Does not corrode Steel Pens.
Is cleanly to use and not liable to Blot.
Flows easily from the Pen.
Blotting-paper may be applied at the moment of writing.

May be had in *London* from BARCLAYS, NEWBERYS, EDWARDS, SANGER, SUTTON. *Liverpool:* EVANS, SONS & Co., AYRTON & SAUNDERS. *Leeds:* GOODALL, BACKHOUSE & Co. *Exeter:* EVANS, GADD & Co. *York* and *Edinboro':* RAIMES & Co. *Newcastle-on-Tyne:* ISMAY & Co. *Coventry:* WYLEYS & Co.

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A willing mind makes light employment.

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Medical Shop Fitters and Case Makers.

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Labour well planned is half done.

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EXPERIENCED WORKMEN SENT TO ALL PARTS OF THE COUNTRY.

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Prepared from fresh Fruit, and specially adapted for the preparation of Orange Quinine Wine.

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In Bottles (6 to gall.), 24s. per doz. Small Bottles, 10s. 6d. per doz.

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N.B.—The price of the Tincture has been very greatly reduced.

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	Net Cash.	To Acct.
Plain Black Currant, old square ...	2/6	2/8
,, ,, ,, rough oval ...	2/6	2/8
Black Currant and Ipecacuanha ...	2/6	2/8
Black Currant and Tannin	3/0	3/3
Black Currant Voice (warm astringent)	3/0	3/3
Black Currant Cough Lozenges* ...	3/6	3/10

(*Ipecac. and Morph., strength as "B.P.")

In Bottles, 1lb., 2lbs., 4lbs., and 7lbs. For Exportation, in Soldered tins, of any size. From EDWARDS, London; through any Wholesale House; and from the Manufacturers,

RANDALL & SON, Southampton,

Who will forward Samples by post on application.

Also, BROWN COUGH LOZENGES, 2s., 2s. 2d.; 7lbs. stamped with name free, and MUSK LOZENGES (*Special*), 2s. 6d., 2s. 8d.

N.B.—Medical Lozenges of every kind, including those of the Pharmacopœia of the Hospital for Diseases of the Throat, London.

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WHITE FELT
CORN AND BUNION PLASTERS,
INVENTED AND ESTABLISHED BY
HENRY YOUNG,
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Albatum or White Rouge, for Cleaning Gold, Silver and Plated Goods.

Since its introduction as a substitute for the ordinary Rouge, a quarter of a century ago, the sale has amazingly increased both at home and abroad. A trial is only needed to prove its superiority over other Plate Powders in use. Sold in Boxes at 1s. and 2s.; Tins, 6s.

6, PONT STREET, BELGRAVE SQUARE, and 48, BELGRAVE ROAD, S.W. } LONDON.

JAMES'S FEVER POWDER,

Prepared by J. L. KIDDLE, Chemist,
Late of 31, HUNTER STREET, BRUNSWICK SQ.,
LONDON.

Sold in BOTTLES *containing* ONE OUNCE, *at* 4s. 6d., *and* PACKETS *at* 2s. 9d. *each.*

Messrs. BARCLAY & SONS, 95, Farringdon Street, London, have been appointed **Sole** Wholesale Agents from this date.

January, 1878. J. L. KIDDLE.

NOTICE OF REMOVAL

INGRAM & ROYLE

Importers of Natural Mineral Waters,

Beg to announce that they have REMOVED to more commodious PREMISES:—

52, FARRINGDON STREET,

LONDON, E.C.

119, *Queen Victoria Street, March* 1*st*, 1884.

GIBSON'S

DELECTABLE JUJUBES, VOICE JUJUBES, AND GLYCERINE PASTILLES,

Put up in 4-lb. Decorated Tins with Glass Lids, *TINS FREE*, are now being inquired for by buyers from all parts of the world. They are not surpassed in quality by any maker, and give entire satisfaction.

MEDICATED AND HIGH-CLASS LOZENGES, of every kind,

Sent out in 2-lb. or 4-lb. Bottles, Bottles Free ; or in Tins, from 10-lb. upwards.

LIME JUICE TABLETS. MALT TABLETS.

ACID DROPS & BEST QUALITY BOILED SUGARS of EVERY KIND

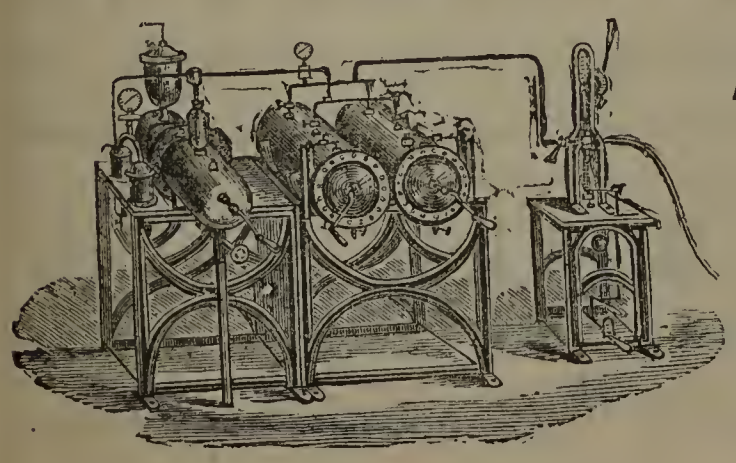
GIBSON'S ORIGINAL CHLORODYNE LOZENGES.

PENNY SUGAR WORM CAKES, suitable for either *children* or *adults*. Have an immense sale, keep in any climate, and please everybody. Manufactured by

ROBERT GIBSON, Carlton Works, Hulme, MANCHESTER, and 1, Australian Avenue, LONDON.

Price Lists sent on application. Our Goods can be bought through any Wholesale or Export House in London.

SODA WATER MACHINERY,



Patent Stoppered Bottles,

AND ALL APPLIANCES.

Before purchasing send for Catalogues to

DAVENPORT & CO.

99P, High Holborn, London.

"PURE WATER is only to be obtained from NATURAL SOURCES."

Vide LANCET, July 7, 1883.

The continually accumulating evidence that typhoid, diarrhœa, diphtheria, and the allied zymotic diseases and ailments are chiefly induced by the consumption of the ordinary drinking water supplied in town and country indicates the value to the medical profession of an absolutely pure natural mineral water which can be recommended with confidence for daily use.

APOLLINARIS NATURAL MINERAL WATER completely fulfils these conditions, as has been proved by the repeated examinations by the most illustrious chemists. Its complete freedom from all impurity, and its agreeable, refreshing, and digestive qualities have for many years secured its recognition and employment by the highest medical authorities as a valuable dietetic agent in daily use, and as a therapeutic in illness and during convalescence.

The MEMORANDUM of the LOCAL GOVERNMENT BOARD, July 13, 1883.

"If any taint (however small) of infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of propagating disease."

The DAILY NEWS, July 19, 1883, says:

"London is still supplied with drinking water from open streams exposed to choleraic infection."

ST. JAMES'S GAZETTE, Nov. 15, 1883

"THE RECENT OUTBREAK OF DIPHTHERIA AT CANTERBURY.—An investigation by the sanitary inspector has revealed the fact that there are upwards of sixty polluted wells in the district in which the cases of disease occurred. In every instance the water was contaminated with sewage and swarmed with living organisms.',

The LANCET says, June 30, 1883:

"Water is the great carrier of the infective germs. It is the water to which we must look."

LANCET, September 15, 1883.

"All parts of the Thames are polluted with human sewage. The whole Thames, in fact, is at all times polluted with unoxidised sewage matters."

REPORTS of the LOCAL GOVERNMENT BOARD.

"Of 142 epidemics of typhoid fever observed in various localities, in 125 cases the epidemic had no other determining cause than the use of water containing impurities."

APOLLINARIS NATURAL MINERAL WATER

"THE QUEEN OF TABLE WATERS."

SOLE IMPORTERS: THE APOLLINARIS CO., LIMITED, LONDON.

NOTE ON LOGWOOD AS A TEST FOR METALS.*

BY ARTHUR WEDDELL.

For some years past I have been accustomed to examine potable waters for metallic impurities by means of the alteration produced in the colouring matter of logwood, and as it furnishes a delicate and convenient means of detecting their presence I have thought it worth bringing before this Society. When logwood is digested with alcohol an extract of a rich yellow colour results, and this colour is not changed on dilution with a pure, freshly distilled water. When added to ordinary samples of water, which contain calcium carbonate in solution, the yellow colour is changed to a beautiful rose red, or if a metal be present to blue.

These changes are accounted for in the following manner:—Hæmatoxylin, the ordinary colouring matter of logwood, is converted by oxygen, especially in the presence of alkalies, into an oxidized product known as hæmatëin, which gives a blue precipitate with salts of iron, lead, copper and many other metals, or if the solution be extremely dilute, a blue coloration only. This reaction is so delicate that 1 part of lead in 100,000 parts of water is easily detected, and with care 1 part in 200,000.

These changes do not occur in acid solutions. The method of using the test is extremely simple and consists in the addition of a few drops of a very dilute tincture of logwood to the sample under examination, care being taken that the quantity added is not too great, as a trace of metal may be thus overlooked, owing to the difficulty of observing the change of colour in presence of a large excess of red colouring matter.

My own practice is to prepare an alcohol extract of logwood (strength 1 in 100) by maceration and to note how much of this is required to produce a distinct rose colour in 100 c.c. of distilled water rendered faintly alkaline with ammonium carbonate, or in 100 c.c. of hard water free from metals.

This quantity of logwood solution is next added to 100 c.c. of the water under examination, and the two tubes compared. If a rose colour is developed, metals are absent, while a blue colour indicates their presence.

More logwood may afterwards be added to each tube and the progressive differences noted, the blue colour increasing in depth, or to a precipitate if much lead be present.

By adding sufficient lead solution of known strength to the pure water, so as to imitate the colour in the second tube, as in Nesslerizing, an approximate idea of the amount of lead may be obtained, when it is known that no other metal is present; but I have not considered the reaction worth experiment in this direction, because the exact comparison is somewhat difficult and can hardly reach scientific accuracy.

The presence of free acids interferes with the reaction, and these, if present, must therefore be carefully neutralized and a slight excess of alkali added. Free carbonic acid gas should be removed by boiling, but I have never met with drinking water that required such treatment.

A variety of applications of this test will suggest themselves. Some years ago I recommended a convenient means of testing glycerine for lead and other metals, by adding the glycerine to water coloured red with logwood. Soda water may be examined by boiling to free from CO_2 and adding the logwood. Lemonade by adding a slight excess of pure alkaline carbonate and boiling. The mineral and vegetable acids may be examined by neutralizing carefully and adding the solution to water coloured red with logwood.

My attention was first attracted to this test by observing that distilled water stored in a metal cistern when used to dilute a logwood tincture turned it to a dirty greenish colour, and when this was mixed with tap water it turned blue. On examining the distilled water by the ordinary method, with SH_2, the presence of lead was detected, it having been dissolved from the solder used in the joints and in fixing the tap. As I have since met with this same condition of storage and impurity I think it would be well for those who store distilled water in such a manner to ascertain the absence of lead before using it.

[*The discussion on this paper is printed at p.* 728.]

* Read at an Evening Meeting of the Pharmaceutical Society, March 5, 1884.

THE CHEMICAL COMPOSITION AND PROPERTIES OF A CRYSTALLINE PRINCIPLE OBTAINED FROM JAMBOSA ROOT.*

BY A. W. GERRARD, F.C.S.,

Teacher of Pharmacy to University College.

The roots from which the principle under notice was extracted were handed to me in the summer of 1883 by Dr. Murrell, who received them from Messrs. Park, Davis and Co., with the following information:—

"The plant yielding these roots is probably the *Myrtus Jambosa*, L. (*Jambosa vulgaris*, DC.), cultivated on St. Maurice. The fruit has the circumference of a medium sized pear, a smell reminding of roses." In the same communication the plant is also mentioned as the "*Myrtus Jambosa Malacensis*, Spr. Is at home in India and Otaheiti. The fruit is known as the rose apple, is frequently eaten, and the decoction of the bark used as an astringent in dysentery, gonorrhœa and leucorrhœa."

Since I received the root it has been figured in the *Therapeutic Gazette*, and examined and reported on by Dr. A. B. Lyons, who throws some doubt on a statement that it is the root of *Eugenia Jambosa*, and gives his opinion that the root and stem in general aspect resemble plants of the order *Piperaceæ*. Dr. Lyons also names his drug "jambu assu," stating that it is indigenous to Brazil; but that name is applied in Chernoviz's 'Medical Formulary of Brazil' to *Spilanthes oleracea*, the plants of which genus are mostly smooth annual branching weeds, and would scarcely produce roots 10 to 15 millimetres in diameter, the size of jambosa roots. It may turn out that the name "jambosa" is a generic one, used in the Brazils for drugs of the same character; hence its application to both the plants mentioned. I have been enabled, through the kindness of Mr. E. M. Holmes, to examine some flowers of *Spilanthes oleracea*; they yielded me an oleoresin with properties similar to one obtained from jambosa, both being powerful sialagogues.

Dr. Lyons's examination of the root demonstrated

* Read at an Evening Meeting of the Pharmaceutical Society, March 5, 1884.

that it contained a neutral crystalline principle, an alkaloid, a peculiar acid, and an oleoresin. An independent examination of my own gave similar results, except that I did not notice the alkaloid. I since find it is present, but the quantity is so minute that its study is not worth following.

The extraction of the crystalline principle, which is found only in the bark of the root, is extremely easy. My process was as follows:—The bark was separated from the root, finely powdered and percolated with ether; the ether on evaporation gave an abundant crop of crystals, which by washing with ether and again crystallizing from ether were obtained perfectly white.

Properties of Crystals.—They are white and tasteless, melting at 77° C., becoming solid at 60° C.; soluble in cold ether, alcohol, and chloroform, and in hot petroleum ether. They are insoluble in cold water, but soluble on boiling, separating in crystals on cooling. With strong sulphuric acid they yield a bright green colour, soon passing to a deep reddish-brown. With strong nitric acid they react violently, giving off nitrous fumes and forming an orange coloured liquid, from which water precipitates a new compound. They gave none of the reactions of a glucoside, neither do they possess the character of weak resin acids.

Analysis.—Before combustion the crystals were submitted to fractional crystallization from various fluids; the various fractions proving of uniform composition the product was assumed to be pure. By exposure to dehydrating agents it scarcely lost weight.

Four combustions for carbon and hydrogen were made, giving as the average 60·585 per cent. C, and 7·584 per cent. H. Nitrogen being present it was twice estimated by the absolute method, and after the various corrections gave 7·2 per cent. N, leaving a difference of 24·631 O. These figures allow the construction of the formula $C_{10}H_{15}NO_3$, the theoretical percentages of which I have placed for comparison with those found—

	Analysis.	Theory.
C	60·585	60·91
H	7·584	7·6
N	7·2	7·1
O	24·631	24·39
	100·000	100·00

The name I propose for this substance is jambosin. Therapeutically it is of very little interest, as I have taken several doses without any apparent effect. The active principle of jambosa is no doubt to be found in the oleoresin, which is a powerful sialagogue, and deserving of further research.

[*The discussion on this paper is printed at p.* 728.]

A NEW REACTION AND TEST FOR ATROPINE AND THE MYDRIATIC ALKALOIDS.*

BY A. W. GERRARD, F.C.S.,

Teacher of Pharmacy to University College.

Whilst studying the behaviour of atropine towards mercuric chloride I was somewhat surprised to find on mixing hot alcoholic solutions that they gave a yellow precipitate, which on boiling became red. On diluting the mixture with water a further amount of yellow precipitate was obtained, which also changed to red on boiling.

The precipitate separated, washed and dried, was found on analysis to be mercuric oxide, with a small trace of mercurous oxide.

The reaction representing the first change can be shown by the following equation:—

$$2C_{17}H_{23}NO_3 + H_2O + HgCl_2 = 2C_{17}H_{23}NO_3HCl + HgO.$$

In addition to the above reaction, I find that a second one takes place simultaneously. This second reaction is between the atropine hydrochlorate and two more molecules of the mercuric salt, yielding the following combination:—

$$C_{17}H_{23}NO_3HCl + 2HgCl_2 =$$

Atropine hydrochlorate. Mercuric chloride.

$$C_{17}H_{23}NO_3HCl(HgCl_2)_2$$

Dimercuric chloride atropine hydrochlorate.

On cooling and setting aside a few hours this compound separated in tufts of crystalline plates.

It is seen in the first equation that water is essential to the production of the mercuric oxide, this I have proved by mixing absolute alcoholic solutions, also ethereal solutions of the two salts, but no reaction took place until water was added. As commercial alcohol contains traces of water a slight reaction may follow its use. The above experiment was repeated on hyoscyamine, daturine, duboisine, and homatropine, with the same result, thus affording additional proof of the unity of the mydriatic alkaloids.

The composition of the above double salt was established as follows:—500 milligrammes of the carefully dried salt were dissolved in water, and potassic hydrate added in slight excess; the resulting precipitated mercuric oxide was separated, dried and weighed, then calculated as Hg: it gave 228 milligrammes or 45·6 per cent. The filtered solution and washings from the mercuric oxide were faintly acidified with acetic acid, and the chlorine estimated with argentic nitrate, using potassic chromate as indicator; I thus obtained 99·4 Cl or 19·9 per cent. The difference of the above quantities being assumed as atropine would leave 34·5 per cent. for that body, so that analysis and formula percentages may be thus compared:—

	Percentages. Theory.	Percentages. Found.
Mercury	46·1	45·6
Chlorine	20·4	19·9
Atropine	33·3	34·5

To further prove these results another analysis was made as follows:—500 milligrammes of the salt were dissolved in water, and treated with H_2S in excess, and the precipitated mercuric sulphide washed, dried and weighed gave mercury equalling 45·9 per cent. The filtrate and washings were warmed for some time until quite free from H_2S; it was then made neutral with potassic hydrate and the chlorine estimated as above. I now obtained 20·7 per cent. Cl. This result thus confirms the previous analysis.

In addition to the foregoing, I have prepared hydrochlorate of atropine, and treated it with two molecules of $HgCl_2$, and thus obtained the same double compound.

Expecting to find other alkaloids to react in a similar manner, the same test was applied to as many alkaloids as were at my disposal; in no case did I obtain a red precipitate. The following were examined:—Strychnia, brucia, morphia, codeia,

* Read at an Evening Meeting of the Pharmaceutical Society, March 5, 1884.

veratria, aconitia, conia, gelseminia, caffeia, theia, cinchonia, cinchonidia, quinia and quinidia. With most of these I obtained white precipitates; the codeia and morphia became pale yellow on boiling; in many cases crystals of apparently new combinations separated.

For practically working the test, I recommend the following procedure:—To a small portion of atropine in a test tube, add about 2 c.c. of a 5 per cent. solution of mercuric chloride in 50 per cent. alcohol and warm gently; the precipitate will at once appear, and become brick-red in colour. Like most alkaloidal reactions, I find there are certain limiting conditions necessary for the success of the test. It does not answer in dilute solutions, neither does it turn out well if the atropine be added to the mercury, but working as I have described the reaction is strongly marked.

In forensic analysis the above test will be of value, as hitherto no reliable chemical test for atropine has been known. This communication also shows, that under certain conditions, atropine, contrary to the general statement, behaves towards mercuric chloride not like ammonia, but similar to the hydrates of the alkali metals.

[*The discussion on this paper is printed at p.* 729.]

TIN IN CANNED FOODS.*

BY PROFESSOR ATTFIELD, F.R.S., ETC.

From time to time during the past twelve years paragraphs have appeared in newspapers and other periodicals tending in effect to warn the public at least against the indiscriminate use of canned foods. And whenever there has been any foundation in fact for such cautions, it has commonly rested on the alleged presence and harmfulness of tin in the food. At the worst the amount of tin present has been absurdly small, affording an opportunity for one literary representative of medicine to state that before a man could be seriously affected by the tin, even if it occurred in the form of a compound of the metal, he would have to consume at a meal ten pounds of the food containing the largest amount of tin ever detected.

But the greatest proportions of tin thus referred to are, according to my experiments, far beyond those ever likely to be actually present in the food itself in the form of a compound of tin; present, that is to say, on account of the action of the fluids or juices of the food on the tin of the can. Such action and such consequent solution of the tin, and consequent admixture of a possibly assimilable compound of tin with the food, in my opinion, never occurs to an extent which in relation to health has any significance whatever. The occurrence of tin, not as a compound but as the metal itself, is, if possible, still less important.

During the last fifteen years I have frequently examined canned foods, not only with respect to the food itself as food and to the process of canning, but with regard to the relation of the food to, or the influence if any of the metal of, the can itself. So lately as within the past two or three months I have examined sixteen varieties of canned food for metals, with the following results:—

Name of article examined.	Decimal parts of a grain of tin (or other foreign metal) present in a quarter of a pound.
Salmon	none
Lobsters	none
Oysters	0·004
Sardines	none
Lobster paste	none
Salmon paste	none
Bloater paste	0·002
Potted beef	none
Potted tongue	none
Potted "strasbourg"	none
Potted ham	0·002
Luncheon tongue	0·003
Apricots	0·007
Pears	0·003
Tomatoes	0·007
Peaches	0·004

These proportions of metal are, I say, undeserving of serious notice. I question whether they represent more than the amounts of tin we periodically wear off tin saucepans in preparing food—a month ago I found a trace of tin in water which had been boiled in a tin kettle—or the silver we wear off our forks and spoons. There can be little doubt that we annually pass through our systems a sensible amount of such metals, metallic compounds, and other substances that do not come under the denomination of food; but there is no evidence that they ever did or are ever likely to do harm or occasion us the slightest inconvenience. Harm is far more likely to come to us from noxious gases in the air we breathe than from foreign substances in the food we eat.

But whence come the much less minute amounts of tin—still harmless be it remembered—which have been stated to be occasionally present in canned foods? They come from the minute particles of metal chipped off from the tin sheets in the operations of cutting, bending or hammering the parts of the can, or possibly melted off in the operations necessary for the soldering together of the joints of the can. Some may, perhaps, be cut off by the knife in opening a can. At all events I not unfrequently find such minute particles of metal on carefully washing the external surfaces of a mass of meat just removed from a can or on otherwise properly treating canned food with the object of detecting such particles. The published processes for the detection of tin in canned food will not reveal more than the amounts stated in the table, or about those amounts, that is to say a few thousandths, or perhaps two or three hundredths of a grain, if this precaution be adopted. If such care be not observed the less minute amounts may be found. I did not detect any metallic particles in the twelve samples of canned food just mentioned, but during the past few years I have occasionally found small pieces of metal, perhaps amounting in some of the cases to a few tenths of a grain per pound. Now and then small shot-like pieces of tin or possibly solder may be met with. But no one has ever found, to my knowledge, such a quantity of actual metallic tin, tinned iron, or solder, as, from the point of view of health, can have any significance whatever.

The largest amount of tin I ever detected in actual solution in food was in some canned soup, containing a good deal of lemon juice. It amounted to only three-hundredths of a grain in half a pint of the soup as sent to table. Now, Christison says that quantities of

* Read at an Evening Meeting of the Pharmaceutical Society, March 5, 1884.

18 to 44 grains of the very soluble chloride of tin were required to kill dogs in from one to four days. Orfila says that several persons on one occasion dressed their dinner with chloride of tin, mistaking it for salt. One person would thus take not less than 20 to 30 grains of this soluble compound of tin. Yet only a little gastric and bowel disturbance followed and from this all recovered in a few days. Pereira says that the dose of chloride of tin as an antispasmodic and stimulant is from $\frac{1}{16}$ to $\frac{1}{2}$ a grain repeated two or three times daily. Probably no article of canned food, not even the most acid fruit, if in a condition in which it can be eaten, has ever contained, in an ordinary table portion, as much of a soluble salt of tin as would amount to a harmless or useful medicinal dose.

Metallic particles of tin are without any effect on man. A thousand times the quantity ever found in a can of tinned food would do no harm.

Food as acid as, say, ordinary pickles, would dissolve tin. Some manufacturers once purposed using tin stoppers to their bottles of pickles. But the tin was slowly dissolved by the acid of the vinegar. These pickles, however, had a distinctly nasty "metallic" flavour. The idea was abandoned. Probably any article of food containing enough tin to disagree with the system would be too nasty to eat. Purchasers of food may rest assured that the action taken by this firm would be that usually followed. It is not to the interest of manufacturers or other vendors to offend the senses of purchasers, still less to do them actual harm; even if no higher motive comes into force.

In the early days of canning it is just possible that the use of "spirits of salt" in soldering may have resulted in the presence of a little stannous, plumbous, or other chloride in canned food; but such a fault would soon be detected and corrected, and, as a matter of fact, rosin-soldering is to my knowledge more generally employed —indeed, for anything I know to the contrary, is exclusively employed — in canning food. Any rosin that gained access would be perfectly harmless. It is just possible also that formerly the tin itself may have contained lead, but I have not found any lead in the sheet tin used for canning of late years.

In conclusion: 1. I have never been able to satisfy myself that a can of ordinary tinned food contains even a useful medicinal dose of such a true soluble *compound* of tin as is likely to have any effect on man. 2. As for the metal itself, that is the filings or actual metallic particles or fragments, one ounce is a common dose as a vermifuge; harmless even in that quantity to man, and not always so harmful as could be desired to the parasites for whose disestablishment it is administered. One ounce might be contained in about four hundredweight of canned food. 3. If a possibly harmful quantity of a soluble compound of tin be placed in a portion of canned food the latter will be so nasty and so unlike any ordinary nasty flavour, so "metallic" in fact, that no sane person will eat it. 4. Respecting the globules of solder (lead and tin) that are occasionally met with in canned food, I believe most persons detect them in the mouth and remove them, as they would shots in game. But if swallowed they do no harm. Pereira says that metallic lead is probably inert, and that nearly a quarter of a pound has been administered to a dog without any obvious effects. He goes on to say that as it becomes oxidized it occasionally acquires activity, quoting Paulini's statement that colic was produced in a patient who had swallowed a leaden bullet. To allay alarm in the minds of those who fear they might swallow pellets of solder I may add that Pereira cites Proust for the assurance that an alloy of tin and lead is less easily oxidized than pure lead. 5. Unsoundness in meat does not appear to promote the corrosion or solution of tin. I have kept salmon in cans till it was putrid, testing it occasionally for tin. No trace of tin was detected. Nevertheless, food should not be allowed to remain for a few days or even hours in saucepans, metal baking pans, or opened tins or cans, otherwise it *may* taste metallic. 6. Unsound food, canned or uncanned, may of course injure health, and where canned food really has done harm, the harm has in all probability been due to the food and not to the can. 7. What has been termed idiosyncrasy must also be borne in mind. I know a man to whom oatmeal is a poison. Some people cannot eat lobsters, either fresh or tinned. Serious results have followed the eating of not only oatmeal or shell-fish, but salmon and mutton; *hydrate* (misreported *nitrate*) of tin being gratuitously suggested as being contained in the salmon, in one case. Possibly there were cases of idiosyncrasy in the eater, possibly the food was unsound, possibly other causes altogether led to the results, but certainly, to my mind, the tin had nothing whatever to do with the matter.

In my opinion, given after well weighing all evidence hitherto forthcoming, the public have not the faintest cause for alarm respecting the occurrence of tin, lead, or any other metal in canned foods.

[*The discussion on this paper is printed at p.* 730.]

THE STEAROPTEN OF OIL OF PATCHOULY.*

BY HENRY C. C. MAISCH.

Patchouly camphor, a homologue of borneol, as obtained from the oil was in pieces of various size and form, mostly belonging to the hexagonal class of crystals. The colour ranged from light yellow, probably from adhering or enclosed oil, to colourless.

In order to purify the camphor, it was dissolved in alcohol. This solution did not crystallize although evaporated to a syrupy consistency. The alcohol was completely driven off, and the residue dissolved in ether, from which solution it deposited after several times recrystallizing in colourless truncated hexagonal prismatic crystals.

The fusing points of both the crude and the recrystallized camphor were determined. A small quantity was put on some mercury in a beaker glass in which a thermometer was suspended, the mercury covering the bulb. A slow heat was then applied, the mercury in the thermometer rising slowly. The melting point of the recrystallized camphor was found between 55° and 56° C., coming near that determined by Gal in 1869 (*Compt. Rend.*, lxviii., 406), who gives it as 54°–55° C., while another author, de Montgolfier (*Ber. Deutsch. Chem. Ges.*, 1877, 374), gives it as 59° C. The melting point of the crude camphor, determined upon mercury as stated above, was found between 57°–58° C., or about 2° C. higher than that of the recrystallized. The latter again solidified when cooled to between 48° and 49° C., but the congealing point for the crude camphor is between 54° and 55° C. The boiling point determined by Gal, is given at 296° C., the specific gravity as 1·051 at 4·5° C., and the vapour density as 8·00 at 324° C.

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The Pharmaceutical Journal.

SATURDAY, MARCH 8, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE LEGISLATIVE OUTLOOK.

THE progress of events during the last few days has disclosed the present intentions of the Government in respect to two questions upon which many pharmacists in this country are desirous that legislation should take place,—namely, the sale of poisons and the constitution of the Pharmacopœia Committee,—and it seems to us to be very regrettable that those intentions should prove to be of so limited or even negative a character. It is now about sixteen months since the Lords of the Privy Council, being made aware of serious defects in the existing law relating to the sale of poisons, expressed a wish that the Pharmaceutical Socicty should submit to them its views upon the subject in the form of a draft Bill amending the existing law in regard to the sale of poisons. This task was at once undertaken by the Council of the Pharmaceutical Society, and the result was the submission shortly afterwards of a draft Bill, with the provisions of which our readers are acquainted. The parliamentary session of 1883, however, passed away without the Government seeing its way to the introduction of a measure, and the proceedings in Parliament relating to the subject in the present session have hitherto consisted of an almost exact repetition of those of last year,—the introduction of a yet unprinted Bill relating to patent medicines containing poisons by a private member, and an announcement of the intention of the Goverment to deal with the general question. It was only natural, therefore, that the Council of the Pharmaceutical Society, having been induced to formulate its views, should endeavour to obtain some definite information as to the course intended to be taken by the Government, and the consequent correspondence, as laid before it at the meeting on Wednesday last, will be found on another page. It will be seen from this that the Government has decided to confine the Bill that it proposes to introduce to the question of the sale of poisons, and does not intend to include any amendments of the Pharmacy Act in relation to the status or organization of the Pharmaceutical Society.

It would seem, therefore, that little further can be done until the publication of the text of the Government Bill shows the exact official construction placed upon the somewhat vague phrase "amendments on the Pharmacy Acts in relation to the status or the organization of the Pharmaceutical Society." The Council would, however, appear to be quite warranted in expressing its regret at the general tenour of the information, and in stating its inability to see how it is possible to satisfactorily amend the law in regard to the sale of poisons without at the same time dealing with the amendment of the Pharmacy Acts. A superficial knowledge characteristic in amateur legislators, or a wilful blindness that refuses to recognize existing facts, may indeed suggest the entire dissociation of the two subjects; but the basis of the existing law in relation to poisons is too clearly stated to be ignored, and legislation that does not at least attempt to remedy the defects of the Pharmacy Acts and make them effectually operative will leave them less powerful for the public good than before. It is only necessary to refer to the preamble of the Act of 1868, where it is laid down that it is expedient for the safety of the public that persons keeping open shop for the selling of poisons should possess a competent practical knowledge of their business, tested by examination and put in evidence by registration, to show that even the internal arrangements affecting the efficiency of the corporation which performs this duty for the public, and to a greater degree the provisions relating to examination and registration, are worthy of revision when the general subject of poisons is under consideration. The Council, with its intimate knowledge of points in which the Act fails to fulfil the purposes for which it was passed, and the unforeseen subterfuges by which the provisions made in the interest of the public are daily evaded, would have proved sadly lax in the performance of the duty which at the invitation of the Privy Council it had undertaken had it not embodied as far as possible in the draft Bill the whole of the conclusions drawn from its experience. It can be easily understood, however, why the Government, which has had this question somewhat forced upon it by passing events, should in the present state of parliamentary business desire to keep the Bill which it proposes to introduce within the narrowest possible limits. Nevertheless, if it is intended to deal with the question of patent medicines containing poisons, as would seem to be implied in the answer recently given by Mr. MUNDELLA to Mr. WARTON, it will be difficult to steer clear of the Pharmacy Act altogether. Still, pending the appearance of the Bill, it will be hardly worth while to speculate upon its provisions. When it is published, however far it may come short of what may be considered legitimate expectations, it will be certain to receive the most careful consideration from the Council of the Pharmaceutical Society, and no doubt the suggestion as to laying the result of the Council's deliberations before the Government will be followed. It seems probable, however, that the Council may deem it advisable to embody in another Bill the provisions for which the Government declines to accept the responsibility,

and we do not gather from the letter from the Privy Council that any official opposition would be offered to such a course.

On Monday the promised Government Medical Acts Amendment Bill was introduced into the House of Lords and read a first time, and on Thursday its second reading was taken. The Bill appears to be practically in the same form as it was left by the House of Commons at the end of last session, with the exception of an attempt to disarm opposition in one quarter by allowing the Scotch medical corporations to have five representatives on the Medical Council instead of three, as proposed last year. At any rate the clauses relating to the preparation of the British Pharmacopœia remain unaltered. The Bill still provides that the Medical Council shall from time to time cause to be published under its direction a book containing a list of medicines and compounds and the manner of preparing them, to be called the British Pharmacopœia, and that the exclusive right of publishing, printing and selling this work shall vest in the Medical Council. It seems a pity that apparently no heed should have been paid to the prayer of the large number of petitions presented in the closing days of the last session, both from members of the medical profession and pharmacists, asking that provision should be made to include among the members of the Committee charged with the preparation of the national Pharmacopœia a certain number of pharmaceutical chemists. There are some points in the Bill that have excited strong opposition, which may yet imperil its passage; but concerning this request for the proper representation of pharmacists in the Committee entrusted with the duty of preparing their special textbook, we have not yet seen expressed in print a single dissentient opinion. If it had not been that, as before mentioned, the Bill bears the marks of concession in favour of a demand that although strongly supported, was by no means undisputed, it might have been thought that possibly it had not been deemed consistent with the policy ruling the conduct of the Bill to accord even this unanimous request apart from a decision in Parliament. For some inscrutable reason, however, the request not ostensibly disputed has up to the present been ignored, whilst one concerning which there was considerable difference of opinion has been conceded. It seems probable, therefore, that it may become necessary to take active steps to bring the subject under the special attention of Parliament, even before it leaves the House of Lords. In any case, the progress of the Bill will be carefully watched, and we do not doubt that, should it appear necessary in order to secure the object in view, the Council of the Pharmaceutical Society will take the proper steps to bring its legitimate influence to bear, and that the pharmacists throughout the country will, as last year, unite to exercise a constitutional pressure upon their representatives in the House of Commons.

It will be seen from an advertisement on another page that on Wednesday next, at noon, a meeting will be held at 17, Bloomsbury Square, to make arrangements for the usual Annual Dinner of the members of the Pharmaceutical Society and their friends in connection with the Annual Meeting in May. Gentlemen who are willing to become Stewards, but who will be unable to attend the meeting on Wednesday, are recommended to communicate their wish upon the subject at once to Mr. Richard Bremridge.

* * *

The Medical Acts Amendment Bill, which was read a first time in the House of Lords on Monday and a second time on Thursday, is to be considered in Committee on Thursday, the 20th inst.

* * *

On Wednesday last a decision was given in the Court of Appeal of considerable importance in relation to the registration of names as trade marks. The litigation commenced in an attempt made by a firm of oil manufacturers to restrain a competitor from using the term "valvoline," which they had registered as a trade mark used by them before the passing of the Trade Marks Act, 1875. It seems to have been admitted that the word had been used by the plaintiffs as applying to a particular article of their manufacture, and that it had been even used in combination with a device as a distinguishing trade mark. But a previous adverse decision had led to the registration of the term alone. The defendant therefore contended that as the word "valvoline" *simpliciter* had never been used as a trade mark, but only as a descriptive name, the registration of it as a trade mark was bad, and in a cross action he applied that the Registrar of Trade Marks should be ordered to remove it from the Register. This application Mr. Justice Pearson granted, notwithstanding that it was urged that even if the trade mark had been originally bad, it had become good through the lapse of five years since registration, and it was against this decision that appeal was made. The Lord Chancellor, in his judgment, in which Lord Justices Cotton and Fry concurred, said that if the word "valvoline" had been used as a trade mark in this country before the passing of the Act its registration would have been good. A descriptive word might be used as a trade mark, but if the article to which it applied was such that anybody might make and sell it, no right to the word could be got except by user as a trade mark. In this case no such user as a trade mark had been proved, and the original registration under the Act of 1875 having been therefore defective, Mr. Justice Pearson's decision that the name should be removed from the Register of Trade Marks was right.

* * *

Mr. Consul Robertson in a recent trade report, whilst declining to introduce controversial matters, refers to the fact that complaints have reached him as to the manner in which the Japanese Government laboratories are worked to the detriment of importers of drugs, medicines and chemicals. It has been urged upon him that the standard of purity sought to be imposed on these articles upon their entry into Japan is too high when compared with that in force in other countries, and that manufacturers find it difficult to meet the requirements of the Japanese examiners in this respect. We may mention that we recently heard of an instance of

this in the stoppage at the custom house of a consignment of sodium benzoate, on the ground that it did not answer to the German Pharmacopœia test for benzoic acid in the reduction of a permanganate solution, which, as is known, is dependent upon the presence of an impurity in the sublimed acid.

* * *

The *Pharmaceutical Record* says that among the tricks of trade that have recently come to light in the United States is the filling of ginseng root with lead. It may be hoped that the "heathen Chinee," who are the chief consumers of this drug in that country, will show a proper appreciation of this application of the resources of civilization.

* * *

The Bill for the reorganization of the inspection of pharmacies in France, to which we referred recently, has been sent to the Committee charged with the Pharmacy Bill, which is considered to be equivalent to shelving it.

* * *

The publication of a new edition of the French Codex would appear to be imminent, as an official decree has appeared making the "new *Codex Medicamentarius, Pharmacopée Française*," compulsory upon French pharmaciens from the 15th of the present month.

* * *

News has been received that on Friday, the 29th ult., the chemical works in Philadelphia, belonging to Messrs. Powers and Weightman, the large quinine manufacturers, were destroyed by fire. The value of the property destroyed has been estimated to exceed one million dollars, consisting largely of cinchona bark and manufactured products. The firm were the largest holders of quinine in the United States, and one result of the enormous destruction was that the price of bark in the American market immediately went up 50 per cent., and quinine rose from one dollar forty cents to two dollars per ounce.

* *

The Victoria Pharmaceutical Register published in January last, a copy of which has just been received, contains 683 names, showing an increase of 14 as compared with the previous Register.

* * *

The first meeting for the reading of papers of the newly established Glasgow and West of Scotland Section of the Society of Chemical Industry will be held in the Rooms of the Philosophical Society, Bath Street, Glasgow, on Tuesday next, at 8 p.m. The papers to be read are on "The Effect of Temperature in Dyeing," by Professor Mills and Mr. Rennie; "The Production of Ammonia from the Nitrogen of Minerals," by Mr. Beilby; and "The Distribution of the Gases in the Leaden Chamber," by Mr. Mactear. The Chairman of the Section is Mr. E. C. C. Stanford.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday next, March 13, at 8 p.m., when some "Further Notes upon the Synthesis of Uric Acid" will be read by Mr. J. S. Dymond, and a Report upon Pharmacology will be made by Mr. H. G. Greenish.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, March 12, at 9 p.m., when a paper on "Photography with the Microscope by aid of the Incandescent Electric Lamp" will be read by Mr. F. W. Branson, F.C.S.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, March 5, 1884.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Messrs. Andrews, Borland, Bottle, Butt, Churchill, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Squire, Symes, Williams, Woolley and Young.

The minutes of the previous meeting were read and confirmed.

Diplomas.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Haddock, James.
Randall, William Joseph.
Roberts, Edmund.
Wiggin, John Chinery.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Dolbear, John .. ..London.
Haddock, James .....Leigh.
Ord, Septimus William .....London.
Randall, William Joseph.....Wareham.
Roberts, Edmund .....Florence.
Wiggin, John Chinery .....Ipswich.

Chemists and Druggists.

The following chemists and druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Humble, John Mitchell .....Birmingham.
Seivwright, George .....Cullen.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society.

Adamson, William Stewart .....Aberdeen.
Bowering, John.....London.
Clarke, Herbert.....Dover.
Davies, Daniel .....Newcastle Emlyn.
Gill, William.....Nottingham.
Jenkins, Evan Edward ..... Beeston.
Jevons, Wallis Byron ....Market Rasen.
Kerr, William Henry .....London.
Sinclair, Matilda Anne .....Llandudno.

ASSOCIATES.

The following, having passed the Minor examination and tendered (or paid as Apprentices or Students) their subcriptions for the current year, were elected "Associates" of the Society:—

Alderton, James .....Leamington.
Baker, Sidney George .....High Barnet.
Baker, Walter James ... .Dorking.
Bates, John .....Bicester.
Black, James Watson .....Aberdeen.
Borthwick, Robert Waddell ...Bathgate.
Botham, William Bland .....Sheffield.
Burgess, William ..... Runcorn.
Clarke, Richard .....Ruthin.
Davis, Frederick .....Oundle.
Farlow, James Southward .....London.

Fellows, Vincent Litchfield.....London.
Heaver, Arthur William.....Norwich.
Jackson, George Granger .....Buxton.
Leach, John Pickering .....New Shoreham.
Mack, George Henry .....Holt.
Pomeroy, Francis Thomas .....South Petherton.
Potter, John Henry.....Nottingham.
Rawling, William John .....Devonport.
Richards, Thomas Coombs .....London.
Shallcross, Joseph Richard.....Tunstall.
Smith, Samuel Henry .....Leamington.
Southwell, Charles Bullock.....Bridgnorth.
Spratling, Walter..... Boston.
Taylor, George .....Edinburgh.
Wells, Arthur John.....Leamington.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Adams, Walter.....Harrow.
Aspden, Henry.....Over Darwen.
Batterbee, Robert Henry .....Lynn.
Birch, John .....Heywood.
Capon, Henry Charles.....London.
Collett, William James .....Nantwich.
Davis, Herbert P.....Cardiff.
Farquhar, John McKelvie .....Greenock.
Farnworth, Walter .....Blackburn.
Gibson, George Wood .....Whitby.
Gibson, John W.....Richmond (Yorks).
Gould, Charles William .....London.
Graham, Joseph .....South Shields.
Green, Henry Selby.....Penzance.
Groves, Thomas .....Bridport.
Hallam, Samuel Robinson .....Burton-on-Trent.
Hodges, Arthur Lovell .....Sunderland.
Jones, Martin Llewelyn .....Aberdare.
Maddock, Herbert .....Manchester.
Morgan, William John .....St. Clears.
Morrison, Charles Orr.....Sheffield.
Page, Percy Dodson.....Boston.
Parry, John .. ..Llangefni.
Peck, Edward .....Ely.
Peck, Ernest Saville .....Cambridge.
Phillips, George Edward.....Ashbourne.
Rookledge, Frederick .....Easingwold.
Slinn, Harry Edwin .....Burton-on-Trent.
Sloan, William Guley.....Barking.
Thompson, George .....Knaresborough.
Webster, Edward.....Hull.
Widdowson, George William...Leicester.
Wilson, Alexander .....Greenock.
Wyllie, Harry Boak.....Kinghorn.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

RESTORATION TO THE REGISTER.

The name of the following person, who had made the required declarations and paid a fine of one guinea, was restored to the Register of Chemists and Druggists:—

Joseph Clempson, 42, South Street, Manchester Square, London, W.

AUDITORS' REPORT.

The Auditors' Report for the financial year ending December 31, 1883, was laid on the table.

THE CONVERSAZIONE.

It was resolved that the annual Conversazione be held on Wednesday, May 21, and the President, Vice-President, and Treasurer, with Messrs. Butt, Hills and Squire, were appointed a Committee to make the necessary arrangements.

The Secretary was also directed to apply to the Director of South Kensington Museum for permission to hold the gathering in that building.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

FREEHOLD INVESTMENTS.

The Council went into committee to consider this report and on resuming, the motion approving the report of the Committee was carried.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to a former member, aged 77. Applicant had a grant of £10 in March, 1883; has to support a wife, aged 60, in delicate health, and two daughters. Herefordshire.

£10 to the widow of a member from 1856–59, during which time he was in business. Partially supports herself by needlework. Middlesex.

Two other applications had been deferred for further inquiries, and one from an applicant who had had six grants previously was not entertained.

The VICE-PRESIDENT moved the adoption of the report, which was carried unanimously.

The following statement had been submitted to the Committee by the Secretary:—

Benevolent Fund, 1883.

		s.	d.		£	s.	d.
321	Subscribers @	2	6	=	40	2	6
1380	,,	5	0	=	345	0	0
74	,,	10	0	=	37	0	0
904	,,	10	6	=	474	12	0
392	,,	21	0	=	411	12	0
41	,,	42	0	=	86	2	0
3	,,	63	0	=	9	9	0
8	,,	105	0	=	42	0	0
2	,,	210	0	=	21	0	0
2	,,	£21	0	=	42	0	0
34	,,	Odd Amounts.		=	26	19	6
					£1535	17	0

Sources from which the Subscriptions were received.	Total.	Number who do not subscribe.	Number who do subscribe.	Amount.		
				£	s.	d.
Members-Pharmaceutical Chemists . .	1861	950	911	516	19	6
Members—Chemists and Druggists . .	762	378	384	179	1	0
Associates in Business . .	1178	624	554	190	17	10
Associates not in Business .	827	651	176	50	14	6
Registered Chemists and Druggists not connected with the Society . .	9037	8131	906	385	12	8
Firms				112	2	0
Local Pharmaceutical Associations . .				14	14	0
"Chemists' Ball," "Junior PharmacyBall" and "Pharmacy Club" . . .				52	10	0
Other sources .				33	5	6
	13665	10734 who do not subscribe.	2931	1535	17	0

	No. of cases	Amount.			Total of each class. No.	Amount.		
Temporary aid granted during 1883:—		£	s.	d.		£	s.	d.
Members (Pharmaceutical Chemists and Chemists and Druggists), Associates in Business, Associates not in Business, and Registered Chemists and Druggists	26	260	0	0				
Widows of ditto. .	33	330	0	0				
Orphans of ditto. .	3	70	10	0				
					62	660	10	0
Annuities paid during 1883 . . .					42	1283	15	0
					104	1944	5	0

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
January.	Day . . .	469	24	8	17
	Evening . .	155	16	1	7

Circulation of books.	No. of Entries. Town.	Country.	Total.
January	178	164	342

Carriage paid, £2 9*s.* 5½*d.*

The undermentioned donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Pradel (P.), Le Gelsémium sempervirens, 1884.
From Prof. SOUBEIRAN.

Asclepiad (The), no. 1, 1884.
From Dr. B. W. RICHARDSON.

Morel (J.), Essai sur la Classification des Phrénopathies, 1884.

Nieuw Tijdschrift voor de Pharmacie in Nederland, Mei–Dec., 1883.

Pharmaceutisch Weekblad, 1883-4, 36 nos.
From Dr. J. MOREL.

Flora of British India, by Sir J. D. Hooker, etc., part 11, 1883.
From H. M. SEC. OF STATE FOR INDIA.

Midland Medical Miscellany, 1882-3.
From Mr. J. G. F. RICHARDSON.

Kügler (K.), Ueber das Suberin, 1884.
From Prof. FLÜCKIGER.

Geological and Natural History Survey of Canada, Report of progress for 1880-81-82, and Maps.
From the SURVEY.

The Committee recommended the purchase of the undermentioned works:—

New English Dictionary, edited by J. A. H. Murray, President of the Philological Society.

Encyclopædia Americana, 4 vols.

Dymock (W.), Vegetable Materia Medica of Western India.

Whitla (W.), Elements of Pharmacy, Materia Medica and Therapeutics, 2nd ed.

Curator's Report.

The Curator had reported the attendance in the Museum during January to have been:—

	Total.	Highest.	Lowest.	Average.
Morning .	572	44	2	21
Evening .	109	14	1	5

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimens of East Indian Red bark in very fine quills; two fine specimens of a new variety of Zanzibar aloes, recently offered in the London market as "Socotrine" aloes.
From Messrs. A. HILL AND SON.

Specimens of East Indian Calisaya bark in very fine quills. From Messrs. CORBYN, STACEY AND CO.

Specimens of the following drugs from India:—Ekangi, Jonka, Sokai, Salpani, Setara, Parileamo.
From the DIRECTOR, ROYAL GARDENS, KEW.

Specimens of the seeds of *Abrus precatorius* in the pods. From Messrs. T. CHRISTY AND CO.

The further specimens of Cinchona bark from Darjeeling had been received. The collection consists of a fine series of herbarium specimens of *Cinchona officinalis*, *Ledgeriana succirubra*, and ten hybrids; also of young bark of the ten hybrids and powdered bark of the *Ledgeriana officinalis* and *succirubra* for analysis.

The specimens had been mounted and placed in the Museum.

The new show case for new drugs and recent donations to the Museum had been received.

The Professors had attended and reported satisfactorily on their respective classes.

Applications from Dundee University and from Mason's Science College, Birmingham, had been received, asking for copies of the Calendar, which it was recommended should be acceded to, and that in the former case the Journal also should be sent.

Mr. Rastrick, Portsea, and Mr. Robinson, York, had sent collections of autograph prescriptions, for which letters of thanks had been sent.

An estimate for new chairs for the Council room had been submitted, and it was recommended that the chairs be ordered.

Mr. Dunstan, the Assistant Lecturer in Chemistry, had applied for new and more modern diagrams for lecture purposes, and it was recommended that the matter be left in the hands of the President to carry out.

The Ballarat School of Mines and Industries had applied for copies of the Journal, and it was recommended that that institution be placed on the free list.

The PRESIDENT moved the adoption of the report, which, after a few words from Mr. Williams with regard to the diagrams, and an expression of pleasure by Mr. Symes at a statement that the glass cases had now arrived for the exhibition of new drugs and apparatus, was carried unanimously.

LAW AND PARLIAMENTARY.

The Secretary had reported to this Committee the receipt of a reply from the Chemists and Druggists' Trade Association, enclosing a resolution to the effect that the President, Vice-President, Mr. Barclay and the Secretary would, in compliance with the invitation of the Committee, form a deputation to accompany one from the Pharmaceutical Society to wait on the Privy Council.

Communication with the Privy Council.

The following correspondence with the Privy Council Office had been submitted to the Committee:—

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square, London, W.C.
"*February* 13, 1884.

"C. L. Peel, Esq., C.B.,
"Privy Council Office, Whitehall, S.W.

"Dear Sir,—With reference to the Bill, drafted by the Council of this Society and forwarded to you in February last, to regulate the sale of poisons and amend the Pharmacy Acts, I am instructed to ask the Lord President to receive, on an early day, a deputation

representing the Pharmaceutical Society and the Chemists and Druggists' Trade Association, to urge upon his Lordship the importance of introducing it into Parliament during the present session.

"Awaiting the favour of a reply,
"I am, dear Sir,
"Your obedient servant
(Signed) "ELIAS BREMRIDGE,
"*Secretary.*"

"Privy Council Office, Whitehall.
"*February* 15, 1884.

"Sir,—I am directed by the Lord President of the Council to acknowledge the receipt of your letter of the 13th inst., and I am to state, for the information of the Pharmaceutical Society, that Her Majesty's Government have decided to confine the Bill, which they propose to introduce, to the question of the sale of poisons, and not to include in that Bill any amendments of the Pharmacy Act in relation to the status or the organization of the Pharmaceutical Society.

"The Lord President also instructs me to state that if, after the Government Bill has been introduced, the Society desire to submit any observations upon it, his Lordship would be willing to receive a deputation on the subject.

"I am, Sir,
"Your obedient servant,
(Signed) "C. L. PEEL.

"The Secretary,
"Pharmaceutical Society,
"17, Bloomsbury Square, W.C."

The Committee had considered that no useful action could be taken until the terms of the Government Bill were made known, and had communicated to that effect with the Trade Association. The Committee recommended the Council to send the following letter to the Privy Council in reply:—

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square, London, W.C.
"Charles L. Peel, Esq.,
"Privy Council Office, Whitehall, S.W.

"Sir,—I am directed by the Council of this Society to acknowledge the receipt of your letter of the 15th ulto., and I am to state that the Council regret to be informed that Her Majesty's Government have decided to confine the Bill, which they propose to introduce, to the question of the sale of poisons, and not to include in that Bill any amendments of the Pharmacy Acts in relation to the status or the organization of the Pharmaceutical Society.

"I have the honour to be, Sir,
"Your obedient servant,
(Signed) "ELIAS BREMRIDGE.
"*Secretary.*"

The PRESIDENT moved the adoption of the report and recommendations. The draft letter read would, he thought, sufficiently express the feeling of the Council, and was probably a sufficient notice of the receipt of the communication from the Privy Council. In the opinion of the Committee it was not desirable to move any further until the terms of the Government Bill were known. He had no reason to believe, from what information he had been able to gather, that the Government disapproved of the clauses in the Society's Bill which dealt with the organization of the Society, as it had been called. He believed that the Government did not wish at present to undertake much more than the responsibility of dealing with patent medicines, and had the idea, like most persons unacquainted with the subject, that the sale of poisons could be easily dealt with, in a clause or two, and that a short Bill could be drafted, to which there would be no opposition. Whether that expectation would be realized was another question. At present he thought it would neither be wise nor dignified for the Council to take any further action until the Bil was introduced.

Mr. SCHACHT asked for the letter from the Privy Council in which it was first suggested that the Council should draft a Bill.

The Council then went into committee to consider this subject, and a long discussion ensued.

Mr. SCHACHT said the Council had received a request in sufficiently broad terms to frame an amended Pharmacy Bill as to thoroughly justify it in expressing its regret that no amendment of the Pharmacy Act was intended by the Government, more forcibly than was set forth in the proposed letter.

The PRESIDENT pointed out that the written communications from the Privy Council had always been limited to the sale of poisons.

Mr. WOOLLEY thought there should be something added to the letter giving the Privy Council to understand plainly that in the opinion of that Council the two questions must be dealt with together.

Mr. SCHACHT also pressed the point very strongly that the Council was by the Pharmacy Acts appointed the authority to deal with questions affecting the sale of poisons, and it seemed to him that no Bill ought to be introduced in connection with this subject without the Council being consulted.

Mr. HAMPSON also thought the Council had not been very well treated by the Government, and that it could not be too clear in expressing its opinion that no Bill dealing with the sale of poisons only, and not with the other deficiencies in the Pharmacy Act, would have the support of the Council.

Similar views having been expressed by several other members of Council, it was finally decided to add the following clause to the letter to be sent to the Privy Council:—

"I am further instructed to state for the information of the Lord President that the Council of this Society fail to see how it is possible to satisfactorily amend the law in regard to the sale of poisons without at the same time dealing with the amendment of the Pharmacy Acts."

The Council then resumed, and the report and recommendations were adopted unanimously, with the addition of the above clause to the letter.

GENERAL PURPOSES.

The report of this Committee included the usual letter from the Solicitor, stating the progress of cases which had been placed in his hands.

The Committee had also considered several other cases, and in respect to some recommended that proceedings be commenced. In one case of registration the Registrar had reported that on making inquiries, the medical man who had supported the application to be placed on the Register had withdrawn his declaration, and the person in question had withdrawn his claim.

The Registrar was therefore directed to erase the name from the Register.

The report and recommendations were unanimously adopted.

REPORT OF EXAMINATIONS.

February, 1884.

ENGLAND AND WALES.

	Candidates.		
	Examined.	Passed.	Failed.
Major (19th)	7	4	3
Minor (19th)	24	10	14
,, (20th)	29	5	24
,, (21st)	30	12	18
,, (22nd)	27	10	17
	—110	—37	—73
	117	41	76

PRELIMINARY EXAMINATION.

Two certificates received in lieu of Society's examination.

1 College of Preceptors.
1 University of London.

AMENDMENT OF THE BYE-LAWS.

Mr. BOTTLE reminded the Council that the Education Committee had been instructed to carefully examine the bye-laws, with a view to recommending any alterations which might be required in regard to educational matters; and suggested that the same Committee should have power to examine the bye-laws generally, and see if any other alterations were desirable. He thought some of the bye-laws might be modified with advantage.

Mr. WILLIAMS said this was a very wide question, and he did not see why the Committee appointed to deal with the education question only should take upon itself a function which had always been discharged by the Law and Parliamentary Committee.

Mr. BOTTLE said he did not mind which Committee undertook the duty, but if the bye-laws were to be amended at all it was just as well the work should be done thoroughly, and the whole thing brought up to date.

Mr. SCHACHT said there would be one advantage in adopting Mr. Bottle's original suggestion, viz., that the members of the Education Committee had all the details of the bye-laws at their fingers' ends. If thought desirable that Committee could submit its ideas to the Law and Parliamentary Committee, which could bring up a report to the Council upon it.

After some further conversation, Mr. Bottle's suggestion was acceded to, the names of Mr. Robbins and Mr. Williams being added to the Committee.

EVENING MEETING.

Wednesday, March 5, 1884.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The Fifth Evening Meeting of the Session was held on Wednesday last, the chair being taken at half-past eight o'clock.

The minutes of the last meeting were read and confirmed.

As relating to a subject referred to in the minutes, permission was given for the reading of a—

NOTE UPON THE ALKALOIDAL STRENGTH OF THE SAMPLE OF EXTRACT OF NUX VOMICA, EXHIBITED AT THE EVENING MEETING, FEBRUARY 6, BY G. F. SCHACHT.

Some interest having been shown by those present during the dircussion on the paper by Messrs. Dunstan and Short, "On the Preparation of a Standard Extract of Nux Vomica," as to the exact alkaloidal strength of the extract exhibited by myself, a promise was given that the sample should be titrated and the result made known.

In fulfilment of that promise I beg to state that Messrs. Dunstan and Short have been good enough to examine the samples, and that I have also estimated the strength of the extract myself.

Mr. Dunstan reports that he finds it to contain 17·9 per cent. of mixed alkaloids.

My own examination gives me 18 per cent.

These results are practically the same.

Mr. SCHACHT, in continuation, said that the point of interest attached to the determination of the sample referred to in his note was that Messrs. Dunstan and Short, in their paper on extract of nux vomica, read at the last meeting, had given their opinion that an extract of nux vomica should be considered of standard strength when it contained 15 per cent. of the mixed alkaloids. In the discussion that followed the reading of that paper he had ventured to question whether 15 per cent. was quite the wisest percentage that could be selected. In confirmation of his doubt, he might now point out that an examination of the specimen of extract prepared by himself, then referred to, had shown that the percentage was considerably in excess of 15 per cent. The extract was of pill consistence, not syrupy, and prepared in the fashion directed by Messrs. Dunstan and Short. If samples were found on the average to contain more than 15 per cent., it would be a pity to fix 15 per cent. as the standard strength. He thought that most pharmacists would prefer an extract, properly so called, for one diluted with so much spirit and water became a little unmanageable. Such an extract would lose weight by drying spontaneously, and the dispenser would, perhaps, aid the change by gentle heat, and then it would no longer correspond to the standard. He thought that it would have been preferable if the authors of the paper had raised the standard, and that it would be better to arrive at the standard strength by mingling veritable extracts, rather than by adding diluents, such as water and alcohol, which would not give a stable preparation.

Mr. DUNSTAN said that it was not at all surprising that Mr. Schacht's extract contained more than the 15 per cent. which the paper recommended as a standard, since it was not prepared by the process directed in the paper, for as far as he knew there was no estimation made of the alkaloid in the percolate. As to the strength of extract of nux vomica, Mr. Short and he had shown in a previous paper that an average commercial extract contained about 15 per cent., rather less than more. They had examined twelve samples. If Mr. Schacht's extract had been prepared by the process the paper recommended, and which involved an actual estimation of the quantity of alkaloid contained in the strong tincture, it would have been found that the finished extract would contain 15 per cent. As it was prepared by simply exhausting nux vomica with spirit, it was not at all surprising that it contained 18 per cent. Mr. Schacht had said that 15 per cent. extracts were not of good consistence, but that depended entirely upon the nux vomica used. It would be the case if they used a nux vomica containing a low percentage of alkaloid, such as 2·2 or less than $2\frac{1}{2}$ per cent., but one containing more than $2\frac{1}{2}$ per cent. would give an extract which was all that could be desired pharmaceutically. Mr. Schacht used a nux vomica containing a very low percentage of alkaloid, namely, about 2·2. Of course the 15 per cent. extract prepared from that would necessarily be soft. An important objection to taking 18 per cent. as a standard was that it was rather above the strength of the ordinary extract of commerce. An alteration of 3 or 4 per cent. in a substance like extract of nux vomica would be dangerous, and further, when one used a nux vomica containing a high percentage of alkaloid, in order to obtain an 18 per cent. extract, the preparation had to be evaporated till it became too hard for convenient use.

Mr. GILES said that he thought that, in the main, Mr. Dunstan and Mr. Schacht were agreed, namely, that it was important to have a standard preparation of extract of nux vomica. As to whether the standard should be 15 per cent. or 18, it was not very important. Fifteen was a more symmetrical number, and more convenient for calculation. There were two ways of settling the question between 15 and 18 per cent. One might be to toss up for it, and, in the absence of any better mode, that would be conclusive. The other method was to refer it to a competent authority. The grievous thing was, however, that there was no competent pharmaceutical authority. If he lived for a few years longer he hoped to induce the Society to take such action as would constitute it the recognized pharmaceutical authority, and he would take an early opportunity of inviting his fellow members to support him in that movement.

Mr. SCHACHT said that he did not quite follow Mr. Dunstan in the course which led him so distinctly to the conclusion that the smaller percentage was the right one. Mr. Dunstan had rather levelled at him the fact that the specimen of nux vomica from which he (Mr. Schacht) had

prepared the extract was not a good one. It had, however, given an extract with a higher percentage of alkaloidal value than the richer specimens. He candidly admitted that he was ignorant of the existence of any relations between the extractives and the alkaloids in samples of nux vomica; but from what he could gather from Mr. Dunstan it seemed that, if he had taken a sample of nux vomica which was supposed to be richer in alkaloidal value, he should have got a worse extract.

Mr. DUNSTAN said that if Mr. Schacht took the same quantity of a richer specimen as he did of his own specimen, and exhausted it in precisely the same way, the resulting extract would probably be richer than the 15 per cent. extract he was speaking of. The only way to ensure an exact result was to estimate the alkaloid.

Mr. SCHACHT said that that was so much the better for his argument, because he should then have had to reduce the extract still more to the condition of a rich syrup. All that he was complaining of was that 15 per cent. was below the strength which an extract should have. He could reduce the extract to 15 per cent. by adding spirit and water, but the extract would not be a good one pharmaceutically, and he should deprecate the addition. He followed Mr. Dunstan's directions with the single exception that he did not stop at the syrupy preparation, but made a real extract, and the result was a much richer percentage. The whole question was whether an extract was to be syrupy or of a pill consistence. From the point of view of a practical dispenser, he maintained that Mr. Dunstan's preparation was not an extract, and that if that preparation was brought to an extract it would contain more than 15 per cent.

The PRESIDENT said that it seemed to him that the author and Mr. Schacht were a little misunderstanding one another. The idea in Mr. Dunstan's mind was, while working scientifically, to come to a conclusion which he (the President) ventured to call a commercial conclusion, and one which should have the least danger to the public. In this particular instance he was disposed to agree with the advisability of keeping a moderately low percentage of alkaloid as a standard. In sanctioning a preparation of the important character of extract of nux vomica, it was necessary to take a strength which would always be obtainable from those specimens of nux vomica seeds which were the weakest in alkaloids, and which might, nevertheless, have the physical characters associated with good nux vomica seeds, so that pharmacists should have an opportunity of reducing to the standard, if need be, rather than increasing. He thought, with regard to all potent preparations, that they should be manufactured rather above the average and reduced to the standard. The practical outcome of all pharmaceutical work led him to this view. Those of the members who were onlookers in this discussion might congratulate themselves upon the fact that both sides appeared to have had the best of it.

A paper was then read entitled—

A NOTE ON LOGWOOD AS A TEST FOR METALS.

BY ARTHUR WEDDELL.

The paper is printed on p. 717, and gave rise to the following discussion:—

The PRESIDENT said that this test would not be considered by professional chemists of the same value as many others that were well known, but there were many cases in which the average pharmacist could use such a test with advantage; and they would, therefore, welcome the description of a colour test of this kind suitable for pharmaceutical purposes. He might remark that Mr. Wynter Blyth, a medical officer of health and public analyst, had published in the first number of the *Asclepiad*, a journal edited by Dr. Richardson, a paper in which cochineal was similarly used to detect lead in water. He mentioned this to show that the use of colour tests was not confined to pharmacists.

Professor ATTFIELD, by way of emphasizing what the President had said, stated that, in his opinion, the logwood test was a good one, but it was only a good negative test. In this sense it covered more ground than either sulphuretted hydrogen or sulphydrate of ammonium taken separately, whilst it covered the ground which both those reagents covered if taken consecutively. Secondly, it was a good negative test for pharmacists, because it could be readily prepared and applied. It was said that a little knowledge was a dangerous thing, but he did not think that saying held good so long as it was known that the knowledge possessed was only a little. Those who applied the logwood test should remember that it afforded only a little knowledge respecting the metals in a water. If they found that a metal was present, then, of course, they must go on to determine what metal it was.

Mr. HILLS said he regretted that the author of the paper was not present to show them the different colours obtained under the varying conditions mentioned. He (Mr. Hills) was unable just at present to confirm the statement in the first paragraph of the paper, that the colour of the logwood tincture was not affected on dilution with pure freshly distilled water; for he found that on adding the tincture to distilled water (which had been re-distilled in glass) a bluish colour was produced similar to that occurring when iron or lead was present. He might add that he had not yet tried the effect with the addition of the ammonium carbonate. Hæmatoxylin appeared to be a body of a very delicate nature, for he found it stated in Watts that "a solution of hæmatoxylin boiled in a platinum dish in an atmosphere free from ammonia acquires merely a brownish or brownish-yellow colour; but, if boiled in a test-tube, it assumes in a few minutes a purple colour, showing that the glass has been decomposed and has given up alkali to the water."

The PRESIDENT said that it was perfectly easy to talk about pure distilled water, but it was a very difficult thing to get it. The possible presence of carbonic acid and ammonia ought to be borne in mind. He was sorry that the author was not present to tell them how he standardized his test.

Thanks were voted to the author for his paper.

A paper was then read entitled—

THE CHEMICAL COMPOSITION AND PROPERTIES OF A CRYSTALLINE PRINCIPLE OBTAINED FROM JAMBOSA ROOT.

BY A. W. GERRARD, F.C.S.

The paper is printed on p. 717, and gave rise to the following discussion:—

The PRESIDENT said that he hoped that Mr. Gerrard would continue his researches and let them know more of the oleoresin.

Mr. HOLMES said that he should think that Dr. Lyons's opinion was correct, that the root was much more nearly allied to the *Piperaceæ* than to the *Myrtaceæ*; the fact of its being a sialagogue also pointed to the same conclusion.

The PRESIDENT said that it seemed hardly fair to the alkaloid for Mr. Gerrard to dismiss it as not worth further investigation, and to fix his whole love upon the oleoresin.

Professor ATTFIELD said that he, as a chemist, felt a little hurt at the dismissal which the alkaloid had received. Its further treatment from the therapeutical point of view was perhaps unnecessary, for Mr. Gerrard had taken several doses and it did not do him any harm. But the alkaloid might turn out to be an extremely interesting one from the chemical point of view. Therefore, if circumstances permitted, perhaps Mr. Gerrard would continue the investigation.

Mr. SCHACHT asked whether Mr. Gerrard had endeavoured to form any compounds such as the substance might be expected to form considering its character.

Professor BENTLEY said that he thought that it would

be very important if Mr. Gerrard would investigate the oleoresin. It seemed to be amply deserving investigation. There happened to be in the paper a mention of *Spilanthes oleracea*, which was a very old remedy, and had been known as sialagogue for more than fifty years. It had been largely in use in Brazil for a very considerable period.

Mr. GERRARD, in reply, said, with reference to the alkaloid, that he had worked upon seven pounds of the root, and it yielded him less than a grain of the alkaloid. In order to obtain a sufficient quantity of the alkaloid to enable him to arrive at anything like good results, he should want a very large quantity of the drug. As to Mr. Schacht's question with respect to compounds of this substance, he could state that it did form chlorine and bromine derivatives, but the total quantity of the material which he had at his disposal was not more than 10 or 20 grains, and, hence, he was stopped by the smallness of the quantity. The oleoresin was, no doubt, the active principle, as he had stated, and it was worthy of further research. He had not had much experience with oleoresins. It was not easy to obtain bodies in a definite form from oleoresins.

The PRESIDENT said that he still felt a little grievance on account of Mr. Gerrard having disposed of the alkaloid in a summary way. He had told them that he believed that the oleoresin contained the active principle; but, it was important that the other constituents should be examined, and he (the President) confessed that the paper had not convinced him that the whole activity was in the oleoresin.

A vote of thanks to the author was passed.

The next paper read was on—

A NEW REACTION AND TEST FOR ATROPINE AND THE MYDRIATIC ALKALOIDS.

BY A. W. GERRARD, F.C.S.

The paper is printed on p. 718, and gave rise to the following discussion:—

Professor ATTFIELD said that the meeting ought not to allow that paper to pass without recording its thanks to Mr. Gerrard for the very careful way in which he had worked out the reaction. He had been particularly interested in listening to the paper, though not so much from an analytical point of view, for the reaction did not distinguish between atropine and the other alkaloids, hyoscyamine, daturine, duboisine, and so on. But it was obvious that Mr. Gerrard had obtained a reaction which showed that there were distinct differences of constitution between one group of alkaloids and another. There was a group which gave a particular reaction, and Mr. Gerrard had examined a considerable number of other alkaloids, and found that they did not give it. He (Professor Attfield) had no doubt that when he came to examine more of the alkaloids he would find some which resembled the mydriatic alkaloids and others which would give the reaction in question. This would diminish its value as a test, but he thought that it would greatly increase its value from the point of view of the chemical constitution of alkaloids.

Mr. TANNER asked whether the reaction was shown only by the uncombined alkaloids, or whether the alkaloidal salts also showed it. If so, how did Mr. Gerrard propose to deal with a solution containing alkaloidal salts?

Mr. DUNSTAN inquired whether the equation given in the paper was based upon experimental evidence, or whether it was only an inference. Had the equation been determined quantitatively?

The PRESIDENT said that he had himself made a note with regard to the equation. It was hardly fair to give a reaction of this kind on paper, without giving something more in order to satisfy them that they were not going wrong in quoting the author. With regard to the concluding paragraph of the paper, he did not agree with the author as to the value of a test of this sort. He thought that it was likely to do more mischief than good. In a test relating to alkaloids something more was wanted than an indirect process which was common to a large number of them, according to the author's own showing, and which might be common to a still larger number that he had not yet examined.

Dr. SYMES asked whether the fact that the test acted uniformly with these mydriatic alkaloids did not tend to strengthen the theory that such alkaloids were identical in composition, varying only in constitution. He thought that there was value in the paper to that extent.

Mr. GERRARD said the first question put to him was that of Mr. Tanner, who asked how he should proceed in the case of a substance which contained a salt of the alkaloid. In the case of a *post-mortem* fluid, upon getting out the alkaloidal salt in a state of solution and a state of concentration, he should simply treat it with ammonia, which would throw down the pure alkaloid. Ether would then dissolve out the atropine, and upon evaporation would yield it in a definite form. By resolution in acid and reprecipitation, it might be got in a still purer form. Then it was only necessary to test the residue with the reagent which he had mentioned, namely, mercuric chloride; and in order to make the test as delicate as possible he should suggest that the substance be placed upon a porcelain surface, and a small quantity of the reagent applied to it and heated. The mercuric oxide would then be precipitated. In using ammonia no source of contamination would be introduced, and no body which would give a red precipitate. As the ammonia was entirely dissipated by the evaporation, it might be assumed that the residue was pure atropine. This reaction was intended to apply simply to pure atropine, and not to an atropine salt. Mr. Dunstan had asked whether the equations were merely the results of inference. He might state that he had made analyses of the salts, and taken the molecular weights according to the formulæ which he had given in the paper; and he had treated them in two ways for the mercury. He had precipitated the mercury as mercuric oxide, and estimated it; and he had precipitated it as mercuric sulphide, and estimated it; and the results had been so approximate that he had come to the conclusions stated in the paper. Whether the mercury was attached to the compound in the way in which he had shown in the formulæ. it was impossible for him to say; but this seemed likely. He did not think that it was likely to be mercury of constitution. He did not imagine that the mercury took the place of hydrogen. He thought that the arguments were strongly in favour of the formulæ which he had given. The President had remarked that the reaction might be common to other alkaloids, but he believed that it was generally acknowledged that the mydriatic alkaloids were one and the same, there being only a difference of name. They were isomers, and they behaved generally in a similar way.

Mr. DUNSTAN suggested that, when the paper was published, it should contain the processes upon which Mr. Gerrard based the equations. It was extremely desirable that scientific memoirs should contain experimental results, so that future workers should know precisely how the conclusions were arrived at.*

Dr. SYMES remarked that when it was stated that the mydriatic alkaloids were identical, what was meant was that they were merely chemically identical. He should not like anyone to take a dose of atropine, for instance, as if it was a dose of hyoscyamine.

The PRESIDENT said that he confessed that he sympathized very much with Mr. Dunstan with regard to the reaction. He did not think that Mr. Gerrard was justified in giving that reaction, and he believed that the paper would be very much better without it. The subject of the paper was the question of a test. It was extremely important to determine a test, but it was not essential

* This suggestion has been adopted in some degree by Mr. Gerrard in the paper as printed on p. 718.

that they should attempt to determine what the reaction was in all cases. If an author based on a few experiments a rather important series of what might be called "chemical generalizations," it became a little difficult for succeeding authors to deal with the subject. The last paragraph of the paper, with regard to the value of the test in forensic analysis, was somewhat stronger than Mr. Gerrard could have fairly contemplated. He (the President) should think it very hard to be convicted of poisoning on the evidence afforded by the test. Mr. Gerrard had allowed the scientific use of his imagination to carry him farther than results had warranted. It was a pity to spoil a good thing by too much elaboration.

Thanks were voted for the paper.

The PRESIDENT said that at his request Professor Attfield had consented to bring to a Pharmaceutical meeting a paper he had prepared on a subject of only partial pharmaceutical interest, a paper relating to the questionable occurrence of any important amount of metal in canned or "tinned" foods.

TIN IN CANNED FOODS.

BY PROFESSOR ATTFIELD.

The paper is printed at p. 719, and gave rise to the following discussion:—

The PRESIDENT said that the paper was a very interesting one. Public analysts sometimes alarmed the public by statements based upon the finding of very small quantities of metallic substances in canned meats; and certain members of the public who did not pass preliminary examinations had often a doubt as to what the meaning of 0·0048 of a grain might be. The paper was one which showed the way in which pharmacists might be the bearers of sound technical knowledge to the public at large.

Mr. ATKINS agreed with the President that the paper might be useful on what might be called a semi-pharmaceutical aspect, by assuring the public that there was no ground for alarm. There was a widespread prejudice against tinned foods, and, as the trade in such articles was a growing one, it was desirable that the public should know that no damage would arise from it. The paper brought forward a commercial question of the very first importance.

Dr. SYMES said that Professor Attfield's remarks were also very interesting as confirming some statements made by Mr. Davis, of Liverpool, at a recent meeting of the Chemists' Association. Mr. Davis had arrived at precisely the same conclusion, that no appreciable quantity of tin was found in tinned foods.

Mr. SCHACHT said that he should like to ask whether any of the gentlemen who were accustomed to investigate articles of food for the detection of tin had ever had samples of brown sugar submitted to them for that purpose. A sample of sugar was submitted to him some time ago under the suspicion that a tin compound had been used to produce its beautiful colour; and in a quantity of two pounds he succeeded in getting the faintest conceivable evidence of something which looked very much like tin.

Mr. HOLMES said that a source of danger not mentioned in the paper, in connection with tinned foods, was imperfect soldering, and the consequent passage of air into the can. Under such circumstances microscopic fungi, such as *Penicillium glaucum*, which was known to be poisonous when grown on bread, developed itself. An instance of poisoning by means of this fungus was related in the *Medical Journal* of the previous week. When tinned fruit had been opened and left in the tin for a couple of days, the juice acquired a distinct metallic taste. The same result would be observed in tinned milk which had been opened and left to dry about the tin. He was not surprised that people were afraid of tinned food when they perceived such a taste.

Professor ATTFIELD said, in answer to Dr. Symes, that he had only to remind him that he (Professor Attfield) was not the only one who had drawn attention to this matter, and he hoped he should not be the last, for before such a prejudice as existed in the public mind could be uprooted it would be necessary that many men should make statements of the same kind as those contained in his paper. As to the examination of sugar, some twenty odd years ago, he occasionally found traces of lead, but not of tin. He believed that at that time certain refiners were in the habit of using lead, and it was just possible that a faint trace was left in the sugar. There were complaints on the subject and the evil soon cured itself.

The PRESIDENT said that he believed Dr. Scoffern's process was worked at that time, and afterwards abandoned.

Professor ATTFIELD said that that was the case. With regard to Mr. Holmes's remarks, of course it was well known that if air got into a tin of food it was only a question of time for the food to get damaged and afterwards to become putrid. In the early days of canning manufacturers had difficulties to contend with on that score. He had known them to put the tins of food into a warm room, in order that the putrefaction might take place in their own factories if it was likely to take place at all. As to residues of tinned foods which were left in open vessels, there was no doubt that they might take up portions of tin, iron, or other metal, for if a dirty can was left in contact with the air, both the tin and the iron would become oxidized. If persons were unwise enough to let the food remain long in an opened tin they almost deserved to be punished by the metallic flavour which might possibly be communicated to the residual food.

The PRESIDENT said that it was of the utmost importance when a tin was opened that the whole of the food be at once turned out. He had never yet observed any serious effects when that was done. The palate was in some cases better than any chemical test, and it could detect a difference between fresh lobster and the very best tinned lobster. This difference was often erroneously attributed to metallic contamination. Considering the enormous importance of the articles of food preserved in tins, the paper which had been read might have practical uses in many ways.

Mr. HOLMES called attention to various Museum specimens on the table. There were some samples of the kola nut in a fresh state. It had been said that the red and the white seeds occurred in the same pod, and from the present specimens that seemed to be very likely. He had put on the table some of the bitter kola nuts. In some parts of Africa these were turned to the same uses as the true kola nuts. One curious feature in connection with the bitter kola seed was that although it was a dicotyledonous plant, it did not possess two cotyledons. The specimen of cymene was interesting as having been prepared by a student in the School. The specimen of squill was presented by Mr. Roberts, an old student. It seemed to be of the red variety which was mentioned in the 'Pharmacographia.'

The PRESIDENT announced that the next evening meeting, the last one of the session, would take place on Wednesday, April 2.

Provincial Transactions.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

The third ordinary meeting was held at the Owens College (by permission of the Council) on Tuesday evening, February 26, Mr. W. Wilkinson in the chair.

The minutes of the last meeting having been read and confirmed, the Chairman called on Mr. W. Kirkby to read his paper on "Disinfectants."

Disinfectants.

BY WILLIAM KIRKBY.

The author opened his paper by a few remarks on the progress of knowledge in connection with diseases since the enunciation of the "germ theory." The work of several scientists bearing on the subject of disinfectants was then passed in review, the researches of Le Bon being first noticed. Special attention was called to the important conclusion he arrived at, viz., that the disinfectant is not the only thing to be considered in the destroying of micro-organisms, as the efficacy of it depends a great deal on what stage of putrefaction the substance is in. The result of his experiments showing that there is no connection between the power of preventing putrefaction and that of arresting it, and also that the virulent power of a putrefying substance and the toxic nature of the volatile compounds given off by it are not necessarily in any relation to one another was briefly considered, together with a short sketch of his experiments. Passing then to Koch's work, the principal points noticed were that he considers an efficient disinfectant to be one that will destroy organisms in twenty-four hours, and that he found carbolic acid to have little or no effect on the spores of *Bacillus anthracis*, but when putrefaction had set in its action on the organisms was very marked.

Having reference to these experiments, it must be evident that it is too much to expect any substance to act in the same manner and with the same energy on every kind of organism. Koch used only aqueous solutions of carbolic acid in his investigation, as solutions in oil and alcohol were found to be without effect. The same investigator has reported that sulphurous acid gas has no action unless the articles to be disinfected are first moistened, and even then the germs are not all destroyed. He found that, besides chlorine, bromine and iodine, the only reliable disinfectants are corrosive sublimate, osmic acid and potassium permanganate. Wolffhugel and Knorre's corroboration of Koch's results and their reasons for the inefficacy of oily solutions of carbolic acid next claimed attention. Boillat's argument, that although a substance may not destroy organisms, it is quite sufficient for surgical purposes if it arrests the development of the spores, being noticed the author passed on to the researches of Arloing, Cornevin and Thomas. They give as the outcome of their work a list of useful and useless substances in the case of symptomatic *Anthrax*. The most powerful they consider to be carbolic acid, salicylic acid, boric acid, corrosive sublimate and bromine gas. They state that quicklime does not destroy these organisms.

A summary was placed before the meeting of the knowledge which had been acquired by a consideration of the valuable results communicated at various times by these scientists. Carbolic acid may be set down as a good preventive of the development of bacteria; but, except in a few cases, has only feeble action on the living organisms. It was recommended that oily solutions of this disinfectant should be abandoned. Potassium permanganate is more effectual in destroying the living bacteria than in arresting development. Salicylic acid appears to be of considerable service. The other articles mentioned in the paper were just glanced at. The author concluded by saying many articles had been shown to have no just claim to the name of disinfectant; others are only of limited utility, and that no one article, except it be powerful poison, can be used for every kind of putrefaction.

After the reading of the paper, a discussion ensued, in which the Chairman, Messrs. Hermann Woolley, Lane and Elborne took part.

Mr. Kirkby having replied,

The Chairman called upon Mr. Elborne to read his paper on "Exotic Henbane."

Exotic Henbane.

BY WILLIAM ELBORNE,

Assistant Lecturer in Materia Medica and Pharmacy, and Curator of the Materia Medica Museum, Owens College.

About a month ago my attention was drawn to the fraudulent nature of some exotic henbane which was being offered in the market, receiving a sample of the same for examination with the accompanying letter:—

"Bodicote,
"*Jan.* 23, 1884.

"My dear Sir,—There are doubtless many evils in the world which can never be eradicated, but there are yet many of a fearful character which certainly may be annihilated by the advance of science. Is it not astounding that with the great advance in chemistry and pharmacy and the growing caution in the administration of medicine that an article such as I herewith enclose you should find customers in this country to the extent of some tons? It is sold as henbane leaves, on the preparations of which may depend the lives of hundreds of human beings. A foreign house has to-day had the impudence to offer me half a ton at 40*s.* per cwt. I think it right that such facts as these should be made known to such institutions as those of which you are a member, for I cannot either in appearance or flavour of the drug enclosed detect any relation to the plant *Hyoscyamus*.

"I am,
"Yours faithfully,
"To Mr. W. Elborne." "Rufus Usher.'

The specimen consisted of dry shrivelled up leaves and stalks, with a peculiar odour altogether unlike that of henbane, and upon a careful examination I found it consisted entirely of the leaves of *Datura Stramonium*.

Having discovered the nature of the substitution, it occurred to me to ascertain as far as possible the purity of all the varieties of henbane in commerce, with the view of ascertaining to what extent this substitution was being practised.

I therefore obtained supplies from the leading wholesale houses in London and Manchester, and received quantities of the following (arranged in the order of their value):—

Biennial henbane, second year's growth.*
Biennial henbane, first year's growth.
British annual henbane
German henbane.
Exotic henbane.

Being under the impression some confusion exists or has existed, in relation to the subject of henbane, I might remark before giving the result of my examination that "biennial" and "annual" henbanes are yielded by distinct plants, viz., *Hyoscyamus niger*, var. *biennis*, and *Hyoscyamus niger*, var. *annua*.

The former (the biennial) produces in the first year only a rosette of stalked radical leaves 9–12 inches in length; in the second year throws up a flowering stem 2 or 3 feet in height; and then as the fruit matures the whole plant dies: whereas the annual variety produces its stem, flowers and fruit in the same year and then dies root and stock. It is the second year's dried leaves and flowering tops of the biennial plant which are official in the British Pharmacopœia for the preparation of the tincture, and when obtainable none other should be used.

Having received authentic samples of the latter from Mr. Usher (who probably is the largest grower of henbane in this country), that directed to be used in the Pharmacopœia in the dried state might be described as occurring in nodules (something like Brussels' sprouts) consisting of hairy leaves and purple veined flowers closely matted together, free from stems and stalks. The first year's leaves of the above (erroneously called "annual henbane") may readily be distinguished by their possessing long radical petioles or stalks, and by the total absence of flowers; whereas the

* The only kind recognized in 'Brit. Pharm.'

real British annual henbane in the dried state is found in the form of stalked leaves attached to a stem bearing light yellow flowers less streaked with purple, and the whole plant of a lighter colour and less hairy.

The following is the result of my examination of the numerous samples received. The whole of the English biennial, both second and first years' leaves, were of the best quality, and entirely free from any adulteration or substitution, while the samples received as "German" and "exotic" consisted of the "*annual*" mixed largely with stramonium leaves. The above remarks will tend to show that "exotic henbane" as at present found in commerce is a most worthless article deserving no mention in English pharmacy.

It is, however, satisfactory to learn that the demand for "exotic" is very trifling and that the English biennial maintains its high character as being a pure drug.

After the reading of the paper, a discussion ensued, in which the Chairman, Messrs. Hermann Woolley and Lane took part.

Mr. Elborne having replied,

The Chairman proposed hearty votes of thanks to Messrs. Kirkby and Elborne for their papers, which were seconded and carried with acclamation.

The Chairman then, speaking at some length, took the opportunity of impressing upon the young men present the great advantages which they might derive from cultivating their mental faculties and powers of observation and investigation by writing papers on subjects of interest to pharmacists, and communicating their results to Associations, where much additional knowledge might be learnt from the discussions arising therefrom.

The Chairman having announced the next meeting, the meeting then terminated.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The ordinary monthly meeting was held in the Society's rooms, on Wednesday evening, February 20, Mr. Preston, the President, in the chair.

The Secretary announced the following donation:—The *Pharmaceutical Journal*, from the Pharmaceutical Society of Great Britain.

The President then called upon Mr. H. S. Smith to read his paper on "Volumetric Estimation." Mr. Smith commenced by pointing out the desirability that every chemist and druggist should be able to assure himself, by personal experiment, as to the preparations kept by him being of proper strength, and that for this purpose he should know how to make a volumetric estimation. He recommended masters, therefore, to encourge the study of volumetric analysis by their assistants and apprentices. He then proceeded to describe the principles upon which volumetric analysis is based and showed that it was an application of Dalton's atomic theory. Taking, as an example, lime water, he explained, in detail, the official method of testing it and the facts upon which it is based. Referring, finally, to the subject of indicators, Mr. Smith spoke favourably of the use of phenolphthalein for this purpose.

Mr. Marshall, in proposing a vote of thanks to Mr. Smith for his valuable paper, spoke of the advantages to be derived from a knowledge of such mode of analysis and how essential it was that every chemist and assistant should be thoroughly acquainted with it, both for his own sake and that of the public. He said that during the last few weeks he had examined several samples of lime water, obtained from different shops in the town, and that quite one half of them did not come up to the B.P. standard.

Mr. Fromer seconded the vote of thanks, and, others supporting, it was carried unanimously.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A lecture was given on Wednesday evening, February 27, at the room of the above Association, by Mr. Pickering, the subject being "Electro-plating."

The lecturer commenced by describing the apparatus and chemicals required in this very useful process, giving the rules to be observed during the operation, explaining fully the strength of solutions employed, and impressing upon his hearers the utmost need of perfect cleanliness of the article to be plated. The lecturer then showed to his audience the practical work; first by plating an article with copper, after which he deposited upon it a coat of silver. Besides this, he coated a piece of metal with gold. To all of this, as well as the theoretical part, great attention was paid by the members.

A vote of thanks, proposed by the Chairman, Mr. J. J. Edwards, to the lecturer, concluded the meeting.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

Theory of Magnetism.

On Friday evening, the 29th ult., Professor Hughes delivered a lecture at the Royal Institution, in which he propounded a theory of magnetism, supporting and illustrating it by a number of observations made by him in recent researches that have not yet been published. He commenced by reminding his audience that Coulomb had conceived the idea that when a molecule of matter containing equal quantities of the two magnetic fluids became magnetized, the fluids were definitively divided, and collected at the opposite sides of the molecule. According to Ampère the magnetic fluids revolve round the exterior of the molecule, thus making each molecule a perfect electro-magnet. Professor Hughes, however, considers that all matter, even the ether by which the molecules are surrounded, is magnetic, and that polarity occurs by rotation. The lecturer did not put forward this latter theory as being original, but merely stated that he had taken it as a basis for his researches. In the theories of Coulomb and Ampère it is necessary to suppose the existence of coercive force, but in his own no such supposition is required; indeed, he is of an opinion that what has been called coercive force represents really only the comparative hardness or softness of the iron or other material. Professor Hughes remarked that he had been indebted to the introduction of the induction balance for many of the results which he had obtained, and explained the principal points of a very sensitive needle which he used for many illustrations of his lecture. In demonstrating the difference between the magnetic properties of steel and soft iron, the lecturer magnetized a bar of each, and showed that whilst the steel bar retained magnetism when struck, the soft-iron bar lost all traces of it when dealt a few sharp blows. Not only is this the case, but if the blows be continued, the soft-iron bar becomes magnetized by the earth's polarity. The same results are obtained by application of heat or electricity, or if the bar be allowed to fall some distance. As this latter experiment would necessitate a drop of several feet, the lecturer replaced the bar by a bottle of loose iron filings, which arranged themselves according to the earth's magnetism when dropped for a few inches. The steel bar, though subjected to the same influences, still retained its original magnetism. This difference Professor Hughes considered due to the loose state in which the molecules are held in soft-iron. In proof of this supposition, he showed that a sharp twist of a soft-iron bar produced the same effect as the blows, but that if it were compressed at both ends, so as to keep it in a rigid state, the same results were obtained as with the steel

bar. Another proposition put forward by the lecturer was to the effect that the polarity of the magnet was due to the direction of its stratification, and he showed that when the stratification was reversed the poles were also changed. An account was also given of some experiments upon the atmosphere, which tended to show that in some respects it possesses a magnetic action like that of iron, and this fact Professor Hughes considered to support his theory that there is no magnetic fluid as distinct from the molecule, but that magnetism is an inherent quality in every atom of matter. An interesting experiment was also made, showing that sound is produced by a bar of iron being magnetized, though full explanations could not be given of this and other points owing to the limited time.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, February 28, Mr. H. G. Greenish, Vice-President, in the chair.

Mr. F. McDiarmid read a paper on—

Some Silicon Compounds.

The object of the writer was to trace out the great resemblance which silicon bears to carbon. In the first place it was shown that, like carbon, silicon exists in three allotropic conditions: amorphous, graphitic and crystalline, specimens of two of which were exhibited, and their modes of isolation explained. The chief compound, viz., silica SiO_2 bears a great similarity to CO_2, forming salts with metallic oxides, which are decomposed by acids. The preparation and properties of the following compounds were described, and attention was directed to their analogy to the compounds of carbon:—

Silicon compounds.	Carbon compounds.
SiH_4 silicon hydride, siliciuretted hydrogen or silicomethane.	CH_4 carburetted hydrogen or methane.
$SiCl_4$ silicon tetrachloride.	CCl_4 carbon tetrachloride.
$SiHCl_3$ silicon chloroform, or trichlor-silico-methane.	$CHCl_3$ chloroform or trichloromethane.
$SiHI_3$ silico-iodoform.	CHI_3 iodoform.
SiI_4 silicon tetriodide.	
Si_2I_6 silicon teriodide, from which may be obtained a compound.	
$Si_2O_4H_2$ silico-oxalic acid.	$C_2O_4H_2$ oxalic acid.
SiS_2 silicon disulphide.	CS_2 carbon disulphide.
$(SiOH)_2O$ silico-formanhydride.	$(COH)_2O$ formic anhydride (unknown).

There is a large class of bodies, called silicic ethers, which are produced by the action of alcohols on silicic chloride ($SiCl_4$) and are silicates of alcohol-radicals, *e.g.*:—

$(C_2H_5)_4SiO_4$ ethylic orthosilicate.	$(C_2H_5)_4CO_4$ ethylic orthocarbonate.

From these, by various decompositions, may be obtained acids in which the carbon of the carboxyl (COOH) group is replaced by silicon:—

CH_3SiOOH silico-acetic acid.	CH_3COOH acetic acid.
$HSiOOH$ silico-formic acid.	$HCOOH$ formic acid.
C_2H_5SiOOH silico-propionic acid.	C_2H_5COOH propionic acid.

In the same way the carbon in some of the hydrocarbons may be replaced by silicon:—

$Si(CH_3)_4$ silicic methide or silico-pentane.	$C(CH_3)_4$ tetramethylmethane or pentane.
$Si(C_2H_5)_4$ silicic ethide or silico-nonane.	$C(C_2H_5)_4$ nonane.

The processes for the preparation of most of the above compounds were given, and specimens of the principal compounds shown.

The paper was followed by a discussion, in which the Chairman, Secretary and Mr. Dymond took part.

A Report was then read by the Reporter on Botany, Mr. E. Baily, on "The Continuity of Protoplasm in the Vegetable Cell," in which he brought under the notice of the Association the recent discoveries by Hillhouse and Gardner of filaments of protoplasm connecting the contents of certain cells with each other, which threw much light on the problem of how sensation was conveyed from one part to another in certain plants. He also drew attention to the closer resemblance between plants and animals which was thus indicated, the filaments of protoplasm in plants bearing a resemblance to the nervous system in animals.

The Report gave rise to a discussion, in which the Chairman, Secretary, Messrs. Dymond, Ranken, Short and Thompson joined.

Mr. Thompson then gave the second part of his Report on the "Separation of Chlorides, Bromides and Iodides."

The Report was discussed by the Chairman, Secretary, Messrs. Baily and Eastes.

The meeting then adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the Chemists' Assistants' Association, held on February 27, Mr. Parkinson, President, in the chair, a paper on "The Coal Tar Derivatives used in Pharmacy," was read by Mr. Joseph F. Burnett. The paper opened with a brief description and history of the distillation of coal for gas and tar, and then turned to the constituents and destructive distillation of coal tar, referring particularly to those derivatives which were found in medical and pharmaceutical use. Benzol and its preparations and homologues came first, including nitro-benzol, aniline and the dyes (one of which, rosaniline, was occasionally administered medicinally), toluol, cresol and xylol. Next carbolic acid was noticed, together with those bodies formed from it, such as picric acid, trichlorphenol, the sulphocarbolates, salicylic acid, etc. Salicylic acid was considered with a view to drawing attention to the fact that the artificial was not exactly identical with the natural. Naphthalene and naphthol next claimed attention, and the graphic formula of naphthalene was exhibited with a view to explaining the difference between alpha and beta naphthols, etc. Anthracene and its commercial value were referred to, and a summary of the coal tar distillates in the order of their fractions was given. The paper was brought to a close by an allusion to the bases of coal tar, viz., pyridine and chinoline, etc. The chinoline derivatives, notably kairine, were considered.

About three dozen specimens of the more important products were on the table.

A discussion followed, in which the President, Messrs. Alcock, Cracknell, Flintan and Worley took part.

Parliamentary and Law Proceedings.

"Milk of Sulphur"—Prosecution under the Sale of Food and Drugs Act.

At the Altrincham Petty Sessions on March 3, 1884, Mr. Henry Edward Goodwin, chemist and druggist, of Sale, was charged before Mr. John Allen (Chairman), and Messrs. Edward Collins, H. T. Gaddum, R. P. Gill, and Jesse Haworth, with having sold lac sulphuris as milk of sulphur (*sic*).

The prosecution was conducted by Mr. Harris, magistrates' clerk, on behalf of the authorities, and Mr. Goodwin was defended by Mr. Henry Glaisyer, instructed by the Secretary to the Chemists and Druggists' Trade Association of Great Britain.

Mr. Harris said Mr. Goodwin was charged with having sold, on February 6 last, to the prejudice of one Nathan

Large, the purchaser, a certain drug, to wit "milk of sulphur," which was adulterated with 50 per cent. of sulphate of lime, and was not of the nature, substance and quality demanded by the purchaser, contrary to section 6 of the Food and Drugs Act, 1875.

Mr. Nathan Large deposed that he was an Inspector of Police stationed at Sale. That on February 6 last he went to the defendant's shop and purchased a quarter of a pound of milk of sulphur, for which he paid 5*d*. After he had paid for it, and it had been handed to him, he told the defendant he had purchased it for analysis by the county analyst, and offered to divide the sample into three parts, which offer the defendant declined. He then sealed it up in defendant's presence and numbered the packet 169. After he had told the defendant that he had purchased the article for analysis the defendant said it was not precipitated sulphur, but milk of sulphur containing lime. If the defendant had made that statement before the purchase had been completed he would not have brought it away, because he would have known that he was being supplied with a mixed preparation. He afterwards handed the sample to Superintendent Leighton. Cross-examined: He asked the defendant for milk of sulphur and not for precipitated sulphur. He was served by Mr. Goodwin's assistant, but Mr. Goodwin was himself present at the time the purchase was made. The sample of sulphur purchased was labelled when supplied to him. There was a label put on, but he did not know what became of it. He did not see it afterwards. He did not tear it off or see anyone else tear it off. He did not know at all what became of the label; the packet was labelled when it was handed to him, but he did not see the label afterwards. He did not throw the label on the floor of the shop, or see anyone else throw it there. He asked for milk of sulphur and the drug was supplied to him as milk of sulphur. Before he took the packet away the defendant said it did not contain precipitated sulphur, but milk of sulphur containing lime.

Francis Hinley gave confirmatory evidence.

Inspector Leighton deposed to having received from Large a sample marked 169, which he conveyed on the same day to Mr. Carter Bell, the analyst for the county, whose certificate on the analysis he held in his hand.

Mr. Glaisyer said he had given notice on behalf of the defendant, that he should require the presence of the analyst, and that as Mr. Bell was present it would, he thought, be better that the analyst should put in his own certificate.

Mr. Joseph Carter Bell deposed that he was public analyst for the county of Chester. He received a sample of sulphur from Inspector Leighton on February 6 last, numbered 169. That on analysis he found the said sample to contain 50 per cent. of sulphate of lime. Milk of sulphur should be pure. Cross-examined: Milk of sulphur should be pure, and he should say it should contain no lime. He knew an article called sulphur præcipitatum, B.P. He believed that article was not called milk of sulphur. He believed that preparation was not called milk of sulphur in any pharmacopœia. That preparation did not contain any lime. Neither lac sulphuris nor milk of sulphur was mentioned in any part of the British Pharmacopœia. The term lac sulphuris and milk of sulphur were, however, both mentioned in old pharmacopœias of more than one hundred years ago, and the preparation ordered in those old pharmacopœias did contain sulphate of lime. Consequently there were two preparations known, the one as lac sulphuris, or milk of sulphur, containing lime, and the other as sulphur præcipitatum, or precipitated sulphur, without lime. These were two distinct preparations, the one containing lime was mentioned in a pharmacopœia published so long ago as 1721. There certainly were two articles, and the one made according to the formula given in this 1721 Pharmacopœia and known as milk of sulphur, or lac sulphuris, would necessarily contain sulphate of lime, and the other made according to the recent Pharmacopœia and known as sulphur præcipitatum, or præcipitated sulphur, would not contain lime. He recollected the case of Mr. Marshall, of Runcorn, who was prosecuted in 1876 for selling a similar article to this supplied by the defendant in the case under the consideration of the Bench. The quantity of sulphate of lime contained in the article supplied by Mr. Marshall was about the same or rather greater than that contained in the sample supplied by the defendant, Mr. Goodwin. The Bench at Runcorn convicted Mr. Marshall, he knew, and the case was appealed to the Knutsford Quarter Sessions.

Mr. Glaisyer: At Knutsford, in April, 1877, the case having been very freely gone into, did the Chairman, Mr. Horatio Lloyd, in giving judgment, make use of these words?—"We have been considering this matter since we left the Court, and I am speaking now for all the magistrates who have heard the case. We think although the absence of this substance (milk of sulphur) from the Pharmacopœia would justify the county analyst in taking these proceedings, we cannot for one moment doubt, after the evidence of Mr. Pemberton and others, that in the trade and in the profession there are two distinct things known by the names respectively of milk of sulphur and precipitated sulphur, and that they are supplied to the trade and to the public by those names as two distinct things. We cannot doubt that after the evidence of Mr. Pemberton, who has been prescribing this thing under the very name it was asked for on this occasion, this being a penal action we cannot say otherwise than it has not been made out, and that the appellant committed no offence within the meaning of this Act."

Witness: Yes, but there was no evidence at the hearing of that appeal to support mine; it was a one-sided decision.

Mr. Glaisyer: At all events, one-sided or not, it was the decision of the Court. Now, Mr. Bell, do you recognize the *Lancet* as a medical authority?

Witness: Yes.

Mr. Glaisyer: Then in the *Lancet* of January 6, 1877, appeared this article, "Milk of Sulphur.—When shall we have the last of the wrangles about milk of sulphur? Everyone knows that the article commonly sold as milk of sulphur always contains and must from the way in which it is prepared contain sulphate of lime. It appears to be commonly preferred to the pure precipitated sulphur, and we confess we do not see any reason why it should not be sold if not misrepresented. Milk of sulphur does not mean pure sulphur, but a particular preparation, and we think the Runcorn magistrates were in error in deciding that a purchaser who went to a certain shop for milk of sulphur did not get what he asked for. If he wanted pure sulphur he asked for the wrong article, which was not the fault of the tradesman. The man who wants bread and asks for cake cannot reasonably abuse his baker. Notice of appeal has been given in the Runcorn case, and we trust that a final decision in this not very important question will ere long be obtained." In continuation, he said it had been admitted by the witness that Mr. Marshall, of Runcorn, was convicted by the magistrates there for selling as milk of sulphur an article similar to that supplied by the defendant in this case, and that the conviction was quashed by the decision of the Quarter Sessions Bench at Knutsford. If you think it necessary I am prepared to go further into the matter; but if the case is to go to Knutsford again I think the responsibility of taking it there should rest with the prosecution, and that the decision of the Bench should be in my favour.

The magistrates conferred.

The Chairman: Is milk of sulphur ever prescribed by medical men at the present time, Mr. Bell?

Mr. Bell: No, sir.

Mr. Glaisyer: I most emphatically contradict that statement; I know of my own knowledge that it is still prescribed by medical men eminent in their profession.

The Chairman: The Bench have decided to take Mr.

Horatio Lloyd's view of the case and dismiss the summons.

Mr. Bell, addressing Mr. Glaisyer: My costs, if you please.

Mr. Glaisyer: No, Mr. Bell, we shall most certainly not pay you any costs. The words of the statute are quite clear upon that point by section 21. "At the hearing of the information in such proceeding the production of the certificate of the analyst shall be sufficient evidence of the facts therein stated, unless the defendant shall require that the analyst shall be called as witness." I, on behalf of the defendant, required that you should be called as a witness for the prosecution, and their case was incomplete without your being so called as their witness.

Mr. Harris: That is so; the other side required us to call the analyst as a witness, and we could not complete the case without doing so.

The Supposed Poisoning Case in Sheffield.

The adjourned inquiry into the circumstances attending the death, at Park, Sheffield, of Fred Castle, six weeks old, was continued, on Monday, at the New Inn, South Street, Park, before Mr. Wightman.

Mr. Preston, President of the Sheffield Pharmaceutical Society, was present to watch the proceedings.

The inquest had been twice adjourned, once to enable a *post-mortem* examination to be made by Mr. A. Hallam, and then, in order that the contents of a bottle might be analysed. This bottle was obtained from the shop of Mr. Wilcock, grocer, South Street, Park. Mr. Wilcock had supplied from it a mixture, some of which had been given to the deceased; and the supposition was that this mixture had caused the child's death.

Mr. A. H. Allen, borough analyst, said he had received a bottle from Police Constable Thornton, and had analysed its contents. He found it contained meconic acid and morphia, which were the two characteristic principles of opium, and which proved its presence. He had also examined the four or five drops of the liquid which remained in the smaller bottle, and found that the smell and colouring were identical with the contents of the larger bottle. In his opinion it was the same mixture, but he could not swear that it was, because of the exceedingly small quantity he had received for analysis.

In answer to the Coroner, Mr. Hallam said that he still adhered to his statement made at the last inquiry, viz., that he could not swear that the child died from any narcotic at all. The actual cause of death was congestion of the brain and lungs, caused by opium.

The Coroner said that as Mr. Hallam could not swear that the child had died directly from opium, the jury could only say that it had died from congestion of the brain and lungs. He thought that the grocer was to blame, inasmuch as, though he sold the mixture, he never took the trouble to ascertain its ingredients.

The Jury returned a verdict in accordance with the medical testimony.

Death from an Overdose of Chlorodyne.

The death is reported at Kendal of Mr. Robert Anderson. It appears that for some time past he has complained of being unable to sleep at nights, for which he has been in the habit of taking small doses of chlorodyne. On Wednesday night he retired to rest at about half-past ten o'clock, and on being called by his landlady about seven o'clock on Thursday morning, he returned no reply. The room was thereupon entered, and deceased was found to be in a deep state of unconsciousness. Dr. Sturridge was at once sent for, who upon his arrival pronounced him to be suffering from the effects of an overdose of opium. Every effort was made to bring him round during the day, Dr. Iliffe being also in attendance, but notwithstanding all they could do, the unfortunate young gentleman died shortly before four o'clock in the afternoon, never having shown any symptom of returning consciousness. Beneath his pillow were two bottles that had contained chlorodyne, both of them being quite empty.

BOOKS RECEIVED.

The Colony of British Honduras, its Resources, and Prospects; with particular Reference to its Indigenous Plants and Economic Productions. By D. Morris, M.A., etc. London: E. Stanford. 1883. From the Publisher.

A Text-Book of Inorganic Chemistry. By Professor Victor von Richter. Translated by Edgar F. Smith, A.M., Ph.D. London: H. Kimpton. 1884. From the Publisher.

On Bedside Urine Testing, including Quantitative Albumen and Sugar. By Geo. Oliver, M.D., Lond. Second Edition. London. H. K. Lewis. 1884. From the Publisher.

The Principles of Theoretical Chemistry, with Special Reference to the Constitution of Chemical Compounds. By Ira Remsen, M.D., Ph.D. Second Edition. London: Baillière, Tindall and Cox. 1884. From the Publishers.

Sell's Dictionary of the World's Press. 1883–4. By Henry Sell. London: H. Sell. 1884. From the Publisher.

Annuaire des Specialités Médicales et Pharmaceutiques. 1884. Paris.

Lékárnicky Kalendár. 1884. Poradal J. B. Goller. Prague.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Pharmaceutical Society.

Sir,—One sometimes meets with gentlemen who seriously contend that the universal spread of education is very far from being an unmixed blessing. It is about as satisfactory to argue with these individuals as it is to contest the opinions of those who deny the right of the Pharmaceutical Society to the slightest share of our gratitude. For my part I contend that if the Society could show no other *raison d'etre* than the Benevolent Fund, it could very reasonably demand the support of every right minded person. A society which gives away over £2000 a year for the relief, not only of the members actually connected with it, when in distress, but also to the members of the trade outside its pale, surely must merit something more than consignment to eternal perdition. But let us see how this Benevolent Fund has been brought to its present state. Has it been raised by the individual subscribers sitting still and trusting to Providence and the Council to do everything? Is it not rather that every individual subscriber has done something, be it much or little, towards the sum total. Had the whole trade acted in a similar manner, three or four times the amount might have been easily raised. Therefore, when Mr. Wilkinson's noisy friends next shriek out, "What has the Society done?" let him first of all ask them, "What have you done, individually? Have you done your best to achieve the Utopia for which you are seemingly so anxious?" Let Mr. Wilkinson point his friend to the Benevolent Fund as a result of individual effort, and tell him that to accomplish this has needed something more than a mere reliance upon the Council. Unless the trade are resolved to alter the present state of affairs, the Council is as powerless as a piston rod without steam; but if the trade only say that this sort of thing shall stop, then fifty Councils could not say nay. Mr. Wilkinson thinks one of the principal reasons why the Council exists is that it may

see that pharmacists are not summoned on juries. Now to carry out his own ideas of representation, as opposed to individual effort, let him make a pilgrimage (in his official capacity as representing this much abused Council) and inspect the jury lists at the proper time to see whether any of us are "on" who are entitled to be "off," for whilst we have a local secretary, why should we trouble to examine them ourselves?

I should decidedly like to see the Council adopt a more vigorous policy with respect to the members who do so much to bring disgrace upon our trade; but so long as we make local secretaries and members of local committees of the men who think that their only aim in life is to rob their poorer brethren by sending out an army of half starved men at a starvation rate of wages, to palm off upon ignorant shopkeepers, teething powders containing antimony, cordials, preservatives, etc., containing laudanum, I am afraid it is too much to expect the Council to move. Let us ostracize these men, though they have the wealth of Crœsus or have half the alphabet after their names; let us show the public that though these men are with us they are not of us. Having done this we can then go to the Council and demand a clause or a bye-law expelling these parasites from the Society and the trade. In conclusion, I would say let individual effort be the guiding star in this important question, it will accomplish much in a comparatively short space of time, whilst years or centuries of exclamations and angry taunts will do nothing or even worse than nothing, and let us all remember that though—

"'Tis not in mortals to command success,

Yet

"We can do more—deserve it."

131, *Embden Street, Manchester.* J. Hart.

Sir,—I have read Mr. Wilkinson's letters and it grieves me to see such a wealth of child-like sympathy running to waste when it is so much needed here. We have a large assortment of "poor beggars" languishing in our neighbourhood, and, what may surprise Mr. Wilkinson, we do not love them, and in the hardness of our hearts have a quaint idea of letting them have a healthy time of it, and so induce them to consider the beauties of an emigration scheme. A dozen of them (we have plenty more) keep shops undistinguishable from those of registered men, and a few do a small wholesale as well, supplying Godfrey's cordial and other child destroyers to hucksters and "twopenny-halfpenny shopkeepers." Of this dozen two only, as far as I can learn, ever served an apprenticeship, and as a reward for their superior merit, have post offices attached to their businesses, and up to date are doing very nicely. The rest are a "scratch" pack of fried fish sellers, druggists, porters and mill hands.

Mr. Wilkinson can pour out his pity on this little flock of black sheep, for we have very little of the article in stock here, and I fancy these good people will soon need it.

None of these pharmaceutical poachers come up to Mr. Wilkinson's ideal "poor beggars." The two post masters come nearest, but are not all that he would require in the martyr way, for one openly defies the law on the plea that he was in business before the passing of the Act (he was nearly of the mature age of fifteen at the time), and the other, after fulfilling his apprenticeship, hung about for a bit and then went to one of the London coaches to be crammed, but was referred back to his studies as not having sufficient elementary knowledge, and then, although he knew that several of his *confrères* had been recently warned by the Registrar, he opened a shop. Is it pity these men deserve?

And now for another type. This man, who has bragged in my presence of the large doses of powerful drugs he has given to patients, where doctors hesitated, has recently left his employment to attend to his drug business—it pays so well. I am sorry I cannot say what his late employment was; it was something in the machinery way, I believe, for he was always very grimy with soot and ashes; probably he was a stoker or something of that sort. But it does not matter much, for now he is talking learnedly to ignorant dupes of the virtues of tincty-oppy-hi ("as we chemists call it"), such being his favourite pronunciation of tinct. opii.

Mr. Wilkinson, in his second epistle, seems to think we hould be surprised if we knew the number of letters he had received approving of his sentiments. I for one should not be at all astonished, if I only was certain that all our "poor beggars" could read and write—which is doubtful. Still, I know as a fact that the papa of one of the more juvenile offenders thinks it very clever indeed, and has said so, which is very comforting.

I for my own part dislike the stores about as much as a certain historical character is reported to dislike holy water; but then the *employés* of such institutions are educated people, and such companies furnish foeman worthy of the steel of the Pharmaceutical Society, so that it ought not to be necessary for the Council to waste its strength on individuals when companies are to be fought. But, unfortunately, the House of Lords have tied their hands to a great extent. In each town the chemists ought to help themselves and ventilate a few of the most notorious and easily reached offenders in the police court. The police would finish the work. Such is the opinion of

Nux Vomica.

Sir,—I do not know that I need say much in reply to Mr. Newsam or your other correspondent, who has not the courage to justify his criticism by appending his name. I think I am perhaps quite as loyal to the Society and as ready to lend a helping hand to further its real interests as anyone else; but I am not one of those who think that loyalty to any institution necessitates the approval of everything the governing body may do or leave undone, or that any member who presumes to disapprove of or criticize its actions is therefore disloyal.

My desire is certainly not to minimize but to increase the influence of the Society, and I do not think that by pointing out some of the causes that retard its progress I have done anything to diminish that influence.

Cheetham Hill, Manchester. W. Wilkinson.

Sir,—*Re* the subject of Mr. Wilkinson's letters, I quite and most emphatically endorse the statements he made in his letter, appearing February 13, and also those contained in that appearing to-day.

Let the Council and the Pharmaceutical Society act in such a way as really to represent the whole trade and then, and not till then, will it be really "efficient."

I have written to you before thus and my opinions are still unchanged, and are those of members and the trade generally, I believe, as Mr. Wilkinson points out in his letter of to-day.

16 *and* 17, *Cliffe High Street, Lewes.* W. T. Martin.

Dispenser.—There can be no doubt that the views expressed by you are correct, but it is difficult to persuade the public to act in accordance with them.

C. H. Ering.—Your letter has been handed to the Secretary.

M. P. S.—No doubt decomposition occurred in the almond emulsion. Try bitter almonds.

Inquirer (Barnsley).—We should not expect such a condition. Try the plan of shaking the liquid with some pulped paper and then straining through flannel.

H. T. W.—Consult a medical practitioner.

Saline.—(1) Sodium bicarbonate is permanent in dry air, but gives off carbonic anhydride at a red heat. (2) Tartaric acid melts at 170° C. (3) The use of sugar is optional.

A Country Chemist is recommended to bring any definite information he may possess as to breaches of the Pharmacy Act under the notice of the Registrar.

A. E. J.—The decision in your case seems to be strictly in accordance with the terms of the Act, though we confess we are unable to see in what the article differs from some of the others mentioned.

Cryptogamic.—The artificial acid may be used.

E. J. Evans.—(1) Apply to the Clerk of the Company. (2) A satisfactory knowledge of chemistry.

M. P. S.—Probably *Barbarea vulgaris*, but it is impossible to say with certainty in the absence of flowers and fruit.

G. D. Bowie.—(1) *Polyporus versicolor.* (2) The coloration is due to the mycelium of *Peziza æruginosa.*

Communications, Letters, etc., have been received from Messrs. Hart, Bennett, Barnett and Co., Unsuccessful Candidate, Jersey.

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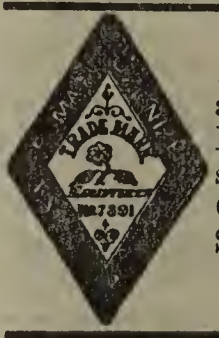

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Soluble Essence of Jamaica Ginger, 4/6 lb.
Guaranteed Pure and free from Capsicum.
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SHEEP OINTMENT
AND GENUINE
ORDINARY SHEEP OINTMENT

As the season for Sheep salving has commenced we beg to call the attention of Chemists to our GENUINE SHEEP OINTMENTS, in the manufacture of which we have had over 40 years' experience.

We have all the latest and most improved machinery for the purpose driven by steam power, and guarantee the quicksilver to be well killed and evenly distributed, and none but the best lard used.

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GOLD MEDAL, ADELAIDE, 1881.

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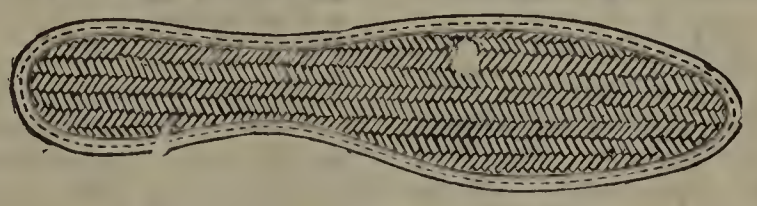

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BEST at the PRICE EVER SOLD. Great strength, and a most useful tea where there is a large consumption. Recommended to all who wish to SAVE in their tea. Agents appointed, where unrepresented, throughout the United Kingdom.

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Mr. W. S. TURNER, Pharm. Chem., M.P.S.

MINOR EXAMINATION, London, February, 1884.

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Mr. W. DUCKWORTH, Blackburn.
„ F. JACKSON, Manchester.

One passed at Apothecaries' Hall.

Mr. D. H. OXEN, Tynemouth.

These three passed at their first attempt.

See advertisement in *Pharm. Journ.* of February 23rd.

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TESTIMONIALS.

PRELIMINARY POSTAL LECTURES.

63, Grey Friars, Stafford,
February 6th, 1884.

Dear Sirs,

It is with great pleasure that I have to inform you that I was successful at the Preliminary exam., January last, and I am sure I owe the whole of my success to your Postal System.

Yours truly,
H. E. S.

MINOR DIVISION.

Lucerne Cottage, Hurstpierpoint,
15*th July*, 1883.

Dear Sirs,

I am pleased to tell you I passed the Minor on Friday last; got through very well indeed. Your valuable works, "Elements of Pharmacy," "Materia Medica," &c., have been of great assistance to me; also I have derived great help from your admirable Postal Lectures, and have great pleasure in bearing testimony to their efficacy, and shall recommend it to anyone who is unable to go to London to study. With your "Handbook to Analysis," and perseverance in practical work, Chemistry, the most difficult subject, is mastered.

Yours very truly,
A. W. H.

MAJOR DIVISION.

1, Easy Row, Birmingham,
30*th October*, 1882.

Gentlemen,

I sincerely thank you for your congratulations on passing the Major examination. I did very well, especially as it was my first time up.

I derived material benefit from your Postal System, chiefly because it defines to a great extent the limits of the work, and also on account of the concise and thorough manner in which the lectures are written. If anyone thinks that the system is a cram, they could not err more grievously.

I should like to make one remark upon your Materia Medica, taken together with your lectures on the subject, it is a perfect specimen of what can be done in a very limited space, by an author who is well up in his subject and possesses the art of teaching to perfection.

Wishing your establishment a continuation of that success which it has now obtained,

I am, &c.,
J. W.

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Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

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For Fees, Syllabus, &c., apply to W. Baxter, Secretary.

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(*Prize Medallist and South Kensington Prizeman*).

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A few pupils can be received indoors.

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AS JUNIOR. In-door. Age 22. 4½ years' experience. Good reference. R. W., 6, Bristol Gardens, Maida Hill, W.

ASSISTANTS WANTED.

A QUALIFIED Assistant, to take management of Chemist's business, in county town. Must have unexceptional references. Apply, stating salary expected and references, E. Gee, Solicitor, Bristol.

WHOLESALE.—An Assistant, in the Warehouse. Out-door. Apply by letter, stating references, Squire, 413, Oxford St., W.

A COMPETENT Assistant (out-door), for the country. Trade chiefly Retail and heavy goods. Salary £70 to £80. No Sunday duty. A pushing young man may find this an improving and permanent situation. State age, reference and reason for leaving last situation. Address, J. Morton, Market Pl., Ramsbottom.

IN London suburb, N.—End of March. An Assistant, of good address, about 21. Must be neat in habits, an accurate Dispenser, and accustomed to light Retail. Time fully occupied. Good references indispensable. State, by letter only, full particulars to S., care of Herrings & Co., 40, Aldersgate St., E.C.

TWO qualified Assistants, not under 25 years of age. Must be competent Dispensers, and capable of taking charge in the absence of the principal. Apply (personally if possible) to W. M. Holmes, 63, Lupus St., S.W.

A COMPETENT and experienced Assistant, for the counter. In-doors. Not under 25. J. G. Gould & Co., 456, Oxford St., corner of Orchard St., W.

IMMEDIATELY.—A Junior Assistant, for light Retail and Dispensing business. In-door. Apply, stating usual particulars, to Hy. Monkhouse, All Saints, Derby.

A SENIOR, about 27, out-door, in a first-class Dispensing business, where two are kept. Must be thoroughly competent Dispenser and neat writer. Apply, stating age, salary expected, and all previous engagements, to H. Thomas, Chemist, St. Leonards-on-Sea.

A JUNIOR Assistant. One accustomed to an agricultural and general Mixed business preferred. Apply, F. T. Patman, King St., Whitehaven.

JUNIOR.—Fred. Coates, New Basford, Nottingham, requires a Junior Assistant by the end of March, to look after a Branch business. Applicants must give full particulars in their first letter, to save time. An abstainer preferred. Comfortable home and time for study.

IMMEDIATELY.—A competent, steady Assistant, accustomed to good class Retail, about 22 years of age. Also an Improver or Turnover. Apply, with usual particulars, to R. F. Young, Pharmaceutical Chemist, New Barnet.

IMMEDIATELY.—A thoroughly reliable Assistant, for a Surgeon's Retail. Small salary, with ample time for study. Abstainer preferred. Home most comfortable. Apply, Zeta, 106, Mildmay Rd., London, N.

A JUNIOR Assistant, for a light Retail and Dispensing business. Age about 21 years. Hours easy. State experience and salary required. Enclose photo., to be returned. Also a well educated youth as Apprentice. In-doors. A comfortable home and every opportunity of gaining a thorough knowledge of the business. Address, Walter Gregory, Dispensing and Family Chemist, Wellington, Somerset.

A JUNIOR Assistant, steady and industrious, for a general Mixed trade. State age, reference, experience, and salary required, to M. Humphreys & Son, 6, Middle Marsh, and 35, Drury Hill, Nottingham.

IMMEDIATELY.—A Junior Assistant. In-door. Good references indispensable. Apply, stating age, height, references, experience, and salary required, to Allen & Lloyd, Chemists, Aldershot.

ASSISTANTS WANTED.

A COMPETENT Assistant, for a country business. About 25 years of age. Well up in Dispensing and an efficient Counterman, with satisfactory references. One desiring a permanency preferred. Apply, with carte and salary expected, to N. W. J., care of Messrs. Barron, Squire & Co., Bush Lane, Cannon St., London.

A STEADY, gentlemanly Assistant, used to Dispensing and good class Retail. Must be quick and obliging. Apply, first by letter, enclosing photo. if possible, to Rupert H. Cumine, Chemist, Forest Gate. Personal interview preferred before engaging. Salary £30 to £35.

A COMPETENT Assistant. One accustomed to a first-class Retail and Dispensing business. Apply, with full particulars (enclosing carte), to J. Babb, Pharmaceutical Chemist, Upper Sydenham. Near the Crystal Palace.

JUNIOR Assistant, in an old-established country business. In-door. With knowledge of Dispensing. Good references indispensable. Apply, stating age, height, references, experience and salary required, to W., 11, Queen Sq., Wolverhampton. Applications not answered within three days declined.

MR. ACFIELD, of Surbiton Hill, S.W., is requiring a good Junior, about 21. He must be gentlemanly, active, of good appearance and address, accustomed to first-class Dispensing and Retail, and a Churchman. Hours light and no Sunday work. Personal interview preferred, otherwise carte, stating full particulars, age, height and salary.

WITH a view to a share and ultimate succession. An in-door Assistant, accustomed to a good Mixed country business, able to Prescribe and Extract Teeth. Must have passed the Minor and have some capital in prospect. Unexceptionable references given and required. Apply, by letter in the first instance, stating age, salary, and other particulars, to A. B., care of Mr. Layman, 50, Southwark St., London.

AN Assistant, about 21 or 22 years of age, accustomed to a Dispensing business. Apply, stating height and salary required, enclosing carte (to be returned), to H. Taylor, 39, Ledbury Rd., Bayswater, W.

JUNIOR. Time for study allowed. Apply, stating salary required, and all particulars, W. M. Bell, 1, Chippenham Pl., Kilburn, London, N.W.

IMMEDIATELY.—An Assistant, accustomed to good Dispensing business, with Minor qualification. About 25 years of age. State salary and other particulars. Apply to Mr. Jones, 135, Ladbroke Grove, Notting Hill, W.

AN Assistant for the West-end, who has passed the Minor examination. Four assistants kept. A quick and accurate Dispenser, with good experience. Age not under 24. Address, A. B., care of Horner & Sons, Mitre Sq., Aldgate, E.C.

IMMEDIATELY. — A Junior Assistant, of good address and business habits. One who has served an apprenticeship in good house preferred. One only kept. Hours 8 to 8. Shop closed on Sunday. Applications not answered in 3 days declined. Apply, with full particulars, enclosing carte (which shall be returned), to Wooldridge & Grisbrook, Windsor.

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MANAGER, for a suburban business. Unmarried. Age about 28. If possible, apply personally to Goodman & Co, 4, Collyer Ter., Gipsy Rd., Gipsy Hill, S.E.

ASSISTANTS WANTED.

A QUALIFIED Assistant, accustomed to a good Dispensing business. One only kept. Apply, with full particulars, to R. S. Dampney, 87, Abingdon Rd., Kensington, W.

AN Assistant, with Minor qualification, for a good class Dispensing business where one assistant only is employed. Salary £45 to £50. Personal application, or full particulars, with carte, to H. C. Birch, Upper Norwood, S.E.

AN Assistant, unmarried, used to good class country Mixed trade, to Manage a Branch. Unexceptional references indispensable. State full particulars to Joseph Blower, Knighton, Rads.

IN-DOOR Assistant, who has had experience in Wholesale, to assist at books, superintend get out orders. Hours 8 a.m. to 7.30 p.m. Apply to Philadelphus Jeyes, Northampton. State age, salary, reference, when disengaged, &c.

IMMEDIATELY.—An Assistant, for a Dispensing and general country business. Out-door. Apply, stating usual particulars, to W. H. Stanway, Chemist and Dentist, Kington, Herefordshire.

APPRENTICE.—R. Prust, Chemist, Roath, Cardiff, requires a respectable youth. One who has passed Preliminary exam. preferred. Comfortable home. Moderate premium. Payments easy. Or application from Turnover or Improver will be considered.

A SENIOR Assistant, not under 25 years of age, of gentlemanly appearance and good address, with Minor qualification. Accustomed to first-class country business. Apply, stating age, height, and salary required, with last reference (enclosing carte), to P. Williams, Pharmaceutical Chemist, 21, West St., Horsham, Sussex.

IMMEDIATELY.—An Assistant, not under 25, qualified, and accustomed to first-class business. Carte (to be returned), with age, height, salary and references, to W. H. Pullin, Leamington.

POSTAL and Junior Assistant, with some experience in Post Office work. Apply to Vines & Froom, 75, Aldersgate St., City. Out-door.

AS Junior Assistant, out-door, in a Mixed country business. Apply, with particulars as to experience and salary required, to Cox & Robinson, Stony Stratford.

A STEADY, competent and obliging Assistant, accustomed to Mixed Retail and Prescribing business. Good references indispensable. Apply, stating age, experience and salary required, to Edwin Fowler, Chemist, Hessle Rd., Hull.

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A 6 FT. plate glass Dispensing Screen, fig. A 55, very handsome figured mahogany, silvered glass back inside case, and fitted with glass (shifting) shelves, with polished edges, tablet on top; a 4ft. do. do., as fig. A 54. E. NATALI, 207, Old Street, near Pitfield Street, E.C.

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FOR SALE.

A SECOND-HAND mahogany plate-glass Tooth Brush Case, £1 10s.; one 6ft. Spanish mahogany Dispensing Screen, with 3 plate-glass doors and plate-glass tablet on top, as fig. A 55, £6 5s.; a 5ft. mahogany circular fronted plate-glass Counter Case, with sloping shelves at the back and tables in the centre, as A 18, £5; 6ft. long, £5 15s.; 7ft. long, £6 10s. J. BYGRAVE, 12, Curzon St., Wenlock St., New North Rd., Hoxton, London, N.

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November 26, 1883.

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Pharmaceutical Society of Great Britain.

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The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

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SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

ELECTION OF COUNCIL AND AUDITORS.

EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 11 a.m., on the **second Tuesday** in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

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Birmingham	Darlington	Jersey	Nottingham
Brighton	Douglas, Isle of Man	Lancaster	Oxford
Bristol	Dundee	Leeds	Peterborough
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* A Certificate of having passed any of the examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, April 2nd.

The Chair will be taken at half-past Eight *precisely*.

With a view of affording greater facilities for the inspection and examination of Specimens and Apparatus placed on the table for exhibition, the Lecture Theatre will be opened at half-past 7, and the Curator of the Museum will be in attendance to give any information or explanation in regard to the articles exhibited that may be required.

Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on April 2nd should be forwarded to the Secretary not later than Wednesday, the 26th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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EVENING MEETING.

The next Meeting will be held in the Society's Rooms on Wednesday Evening, 19th instant, at half-past eight o'clock. Mr. JOHN NESBIT, President of the Branch, in the chair.

The following papers will be read:—

Tincture of Hyoscyamus.
By WILLIAM GILMOUR.

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I. Composition in relation to deterioration.
By PETER MACEWAN.
II. Characters and Tests.
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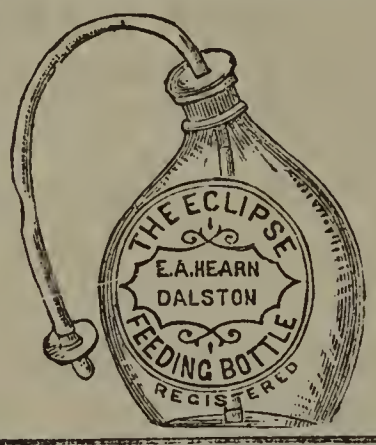

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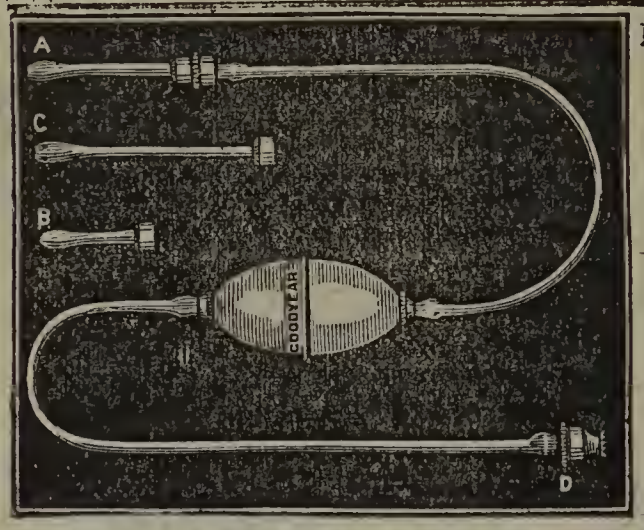

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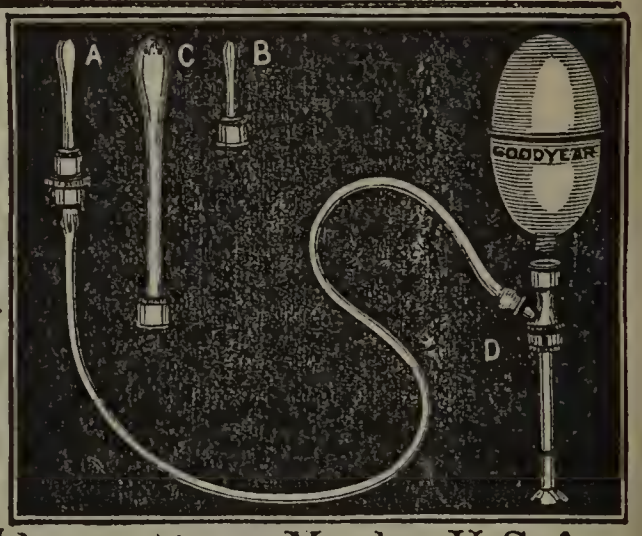

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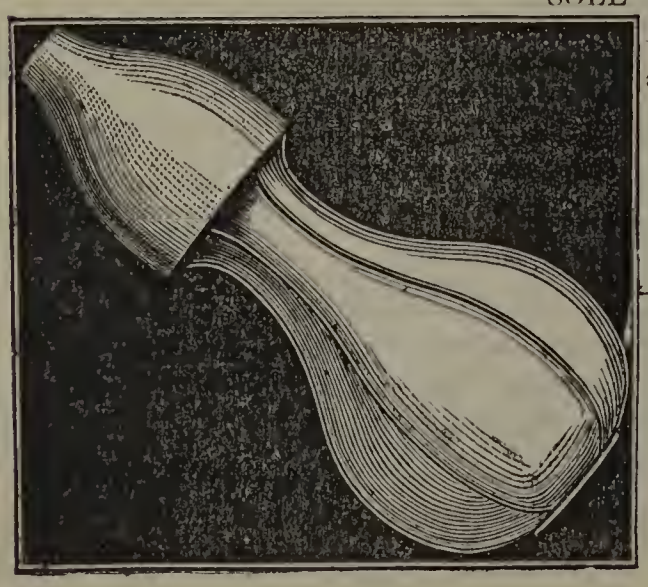

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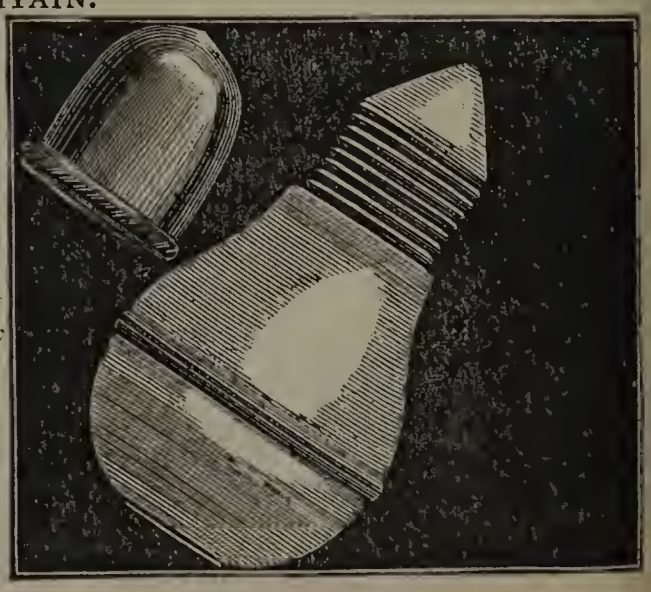

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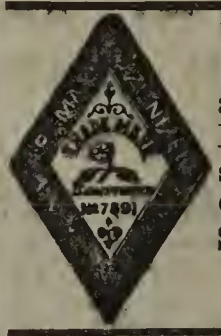

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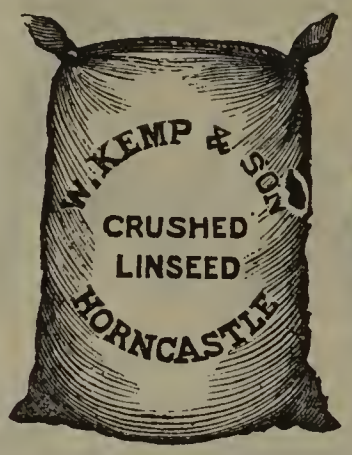

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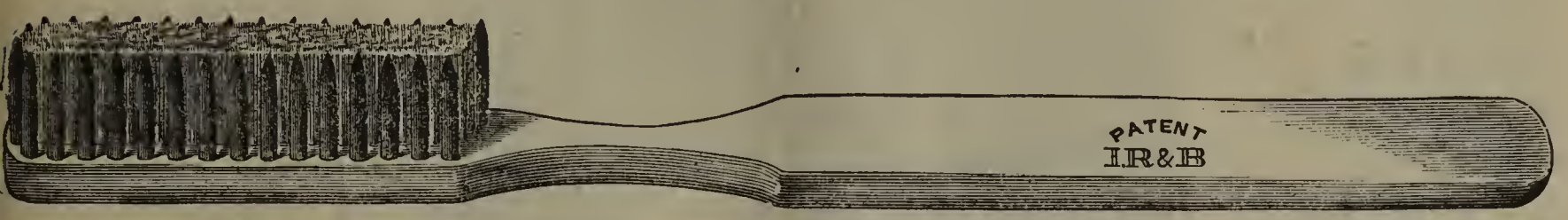

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From *The Journal of the British Dental Association,* January 15, 1884.

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We have received from Messrs. Maw & Co., of Aldersgate Street, specimens of a new pattern tooth-brush, with the above designation, which they are about to bring under the notice of the profession. The initials refer to the "India Rubber and Bristles," of which the brushes are composed. They consist of a narrow bristle brush of the ordinary type, surrounded by a single row of stems of soft red rubber of nearly the same length. They are both efficient and pleasant to use, and we should anticipate that the superior durability and elasticity of the rubber will afford so much support to the bristles as to keep them in shape and working order for a much longer time than an equally soft ordinary bristle brush would wear. The chief object of the rubber addition is, however, to prevent abrasion of the gums, and it appears to answer this purpose very satisfactorily. To persons with tender, or partially edentulous mouths, brushing the teeth is an unpleasant and even painful operation; Messrs. Maw's brushes will certainly reduce the discomfort in such cases to a minimum.

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THE NEW FRENCH PHARMACOPŒIA.

Preliminary Notice.

The new work which from the present date authoritatively displaces the *Codex Medicamentarius* that has been official throughout France during the last eighteen years is the result of the labours of a Commission appointed by President Grévy in February, 1880. The constitution of this Commission is especially referred to on another page, and it need only be stated here that it included among its members men who are eminent in medicine, chemistry, botany, materia medica, and practical pharmacy. The Codex is written throughout in the French language, and in general appearance the new book resembles its predecessor, being printed on the same large octavo page, and following the previous typographical arrangements pretty closely. But a closer examination shows that a considerable alteration has been made in the general arrangement of a great portion of the text, to which more special reference will be made subsequently.

Probably the feature that will first attract the attention of most persons handling the book will be the occurrence of bands of red, white, and blue on the edges, due to the utilization of the republican tricolor as a means of marking off the divisions of the book, after the manner familiar to persons who use the Post Office Directory. These divisions are four in number, the first commencing with some preliminary matter and the last closing with a series of extracts from the laws and regulations concerning the practice of pharmacy in France. Between these lie the four parts of the Pharmacopœia, strictly speaking, devoted to (1) a List of Materia Medica, (2) Chemical Pharmacy, (3) Galenical Pharmacy, and (4) Veterinary Pharmacy.

The Preface is moderately brief, but well-written, and is signed by the President of the Commission. Then, under the title of "*Notions Préliminaires*," follow items of information respecting weights and measures, specific gravity and alcohometric tables, a table of solubilities, and another of equivalents and atomic weights, some of which had a place in the previous Codex. Two or three tables showing the relation of the gram to other French weights that have become obsolete are suppressed; but there remains one table that professes to show the relation of foreign medicinal weights to the gram which certainly shows an excess of conservatism. In it Great Britain and the United States are bracketed together as having the same medicinal ounce and pound, and it is further stated expressly that the pound consists of 5760 grains and is divided into 12 ounces. This was not correct when the previous edition was published in 1866, though perhaps the editors of that period might be excused for not taking cognizance of what had happened outside France within a couple of years; but the perpetuation of the mistake after an interval of twenty years is hardly creditable in an official work. Moreover, the same table attributes to Bavaria, Hanover and Prussia, as medicinal weights, pounds and ounces based upon a grain of a different value in each country, quite oblivious of the fact that since 1870 one Pharmacopœia has been authoritative throughout the whole of the German empire, and that the only measure of weight to be found in it has been the gram. Whilst upon the subject of measures it is worth mentioning, as illustrative of the difficulty with which the most scientifically worked-out systems displace old and familiar ideas, that even in the home of the metric system it is found necessary, on account of certain prescribers, to retain such measures as spoonfuls and glassfuls. All that can be done is to give them appropriate values, which differ, however, in some respects from those given in the Codex of 1866. A teaspoonful (*cuillerée à café*) of water is still defined as weighing 5 grams; but the weight of the dessertspoonful of water is now given as 10 grams; that of the tablespoonful (*cuillerée ordinaire*) as 15 grams, instead of 20 grams; and that of the glassful (*verrée*) as 120 grams, instead of 160 grams. The "handful," however, as a measure of seeds, leaves, etc., and the "pinch," as a measure of flowers, etc., are no longer officially recognized. In order to meet the difficulty attending the measurement of drops a table is given showing the weights of drops of different liquids and the number to a gram. These drops represent those falling from a glass tube terminated by a capillary opening, the exterior diameter of which measures exactly three millimetres. Twenty drops passing through this instrument at a temperature of 15° C. should weigh within two-hundredths of a gram.

The inconveniences attending the use of the degrees of an instrument so arbitrarily graduated as Baumé's areometer for indicating the densities of liquids were fully recognized in the previous edition and provision was made for its substitution. A further step is now taken, and densities in degrees Baumé are no longer given in the body of the work, so that although a table of equivalents is still provided for the sake of convenience, the time is probably brought nearer when the sign "B." will cease to perplex the English readers of French pharmaceutical works. It may be useful to mention that the instrument adopted instead, for liquids heavier than water, is the "densimetre" of Brisson, which is, in fact, an ordinary hydrometer, bearing the figure 1000 at the top of the stem to indicate the level to which it sinks in distilled water at +4° C., the other graduations corresponding to the increasing densities in thousandths. For liquids lighter than water, the centesimal alcohometer of Gay-Lussac is recognized, the zero in the graduation of which corresponds to pure water at 15° C., and the figure 100 to absolute alcohol, so that each degree represents 1 per cent. of absolute alcohol by volume, instructions being given for making the necessary corrections for temperature. A table is also given showing the quantity of absolute alcohol by weight in mixtures corresponding to these degrees, the contraction of acoholic mixtures, the coefficient for the correction of temperature from 0° to 30° C., and the weight of a litre of liquid of particular density in a vacuum and in air. Another table gives the quantities by weight of alcohol of any given degree and distilled water that require to be mixed to obtain a kilogram of alcohol of any of the strengths indicated in the Codex.

Passing now to the First Part of the Pharmacopœia it is found that this consists of a list of the substances derived from animals or plants which are employed in their natural state. In the Codex of 1866 a similar list was followed by one of substances derived from minerals and chemical products, but these articles are now included in the next division. The animal and vegetable materia medica is still very extensive, numbering about four hundred and seventy articles, although considerably over a hundred appear to have been omitted. Little comment respecting the numerous omissions is needed

here beyond the remark that most of these articles could be very well spared; this is true especially of those derived from the animal kingdom, as will be admitted when it is mentioned that they include the frog, a species of viper, the oyster, animal kermes, and the wood-louse. The animal kingdom is, however, by no means abandoned, and among its representatives in the Codex are still to be found the concretions known as crab's-eyes, civette and the apple snail. Among the principal novelties in this list are boldo leaves, the flowering tops and seeds of *Cannabis sativa*, dita bark, eucalyptus leaves, potato starch, jaborandi leaves and podophyllum rhizome.

A glance at the Second Part is sufficient to show that here there has been a radical alteration in the arrangement. In the Codex of 1866 the articles not enumerated in one or other of the materia medica lists were grouped in no less than seventy-five chapters, the nature of which will be best indicated by quoting the titles of half a dozen of them: Simple Bodies, Mineral Acids, Sulphides, Salts with Vegetable Bases, Oils and Fats, and Syrups. As these chapters did not follow in alphabetical order according to their subjects, the device seemed an ingenious one for perplexing any person wishing to consult the work in a hurry. In comparison, therefore, the present arrangement seems preferable. It consists in dividing all these articles, together with those that previously constituted the inorganic list in the materia medica, into two large groups, one designated "Chemical Pharmacy," and constituting the Second Part of the book, and the other entitled "Galenical Pharmacy," and forming the Third Part. In these two parts the articles are arranged alphabetically, according to the individual titles in the Second Part and according to the titles of groups of preparations in the Third Part. This arrangement is fairly convenient in respect to the galenicals; but cannot be said to be so in respect to the chemicals, in consequence of the form of nomenclature adopted, in which only the vernacular is used, the acid radical in compounds coming first. Thus the list opens with "Acétate of Ammoniaque Liquide," followed by "Acétate of Chaux," and the other acetates; and after these come the acids. One result of this is to group all the saline compounds according to their acid radical, so that in order to ascertain what are the official saline compounds of a particular inorganic or organic base it will be necessary to consult the index, and even there the information is not always to be found. Another point that is noticeable is the maintenance of the term representing the oxide of the base in the names of the compounds of the alkalies and alkaline earths. It is a fair question, however, whether the Codex Commission might not have improved its work by conforming to the arrangement now general, according to which the materia medica and the preparations are brought into a single alphabetical list, in which the basic side of a compound regulates its position. At present the Commission will seem to many to have abandoned an untenable position, without having had the courage to continue the movement to its logical end.

As it is proposed to refer on future occasions to the articles in these two divisions in some detail, it will suffice to mention here in the briefest manner some of the principal additions that have been observed in the Second Part of the Codex, since these will to some extent indicate many of the probable novelties in the Third Part. Taking first the alkaloids, the Codex now includes apomorphine and its hydrochlorate, caffeine, conine hydrobromate, eserine and its hydrobromate and sulphate, hyoscyamine, narceine, pelletierine tannate, pilocarpine and its hydrochlorate and nitrate, cinchonidine sulphate and the basic and neutral hydrobromates, and quinidine sulphate. Besides these there have been added the ferrocyanhydrate, lactate, salicylate, hydrochlorate, tannate and two hydrobromates of quinine, hydrobromate of morphine and nitrate of aconitine. Other important organic compounds are crystallized digitalin, picrotoxin, picric acid, salicylic acid and sodium salicylate, ammoniated glycyrrhizin, thymol, chloral hydrate, iodoform, amyl nitrite, ethyl bromide and iodide, monobrom camphor and vaseline. There are four new lithium compounds, namely, the benzoate, citrate, carbonate and salicylate. Hydrobromic acid is supplemented by the bromides of barium, iron, sodium; and the iodides of ammonia and sodium are added. Then there are the hypophosphites of sodium and calcium, sodium chlorate and sulphovinate, calcium acetate, benzoate and lactophosphate, and red phosphorus.

NOTE ON A SAMPLE OF SOPHISTICATED SAFFRON.

BY J. HART, PH.C.

A few days ago my attention was drawn to a yellow powder at the bottom of a shop bottle containing saffron (*Crocus sativa*). The abundance of the powder (in proportion to the small quantity of saffron), together with its weight, induced me to make a thorough examination of it, and as I have not met with similar results (possibly owing to the want of indices and of more time to search the literature), the following remarks may be of interest:—

For the purpose of comparison, 10 grains of a very fine sample of saffron, recently purchased, were incinerated in a platinum crucible; the ash obtained weighed ·5 grain, equalling 5 per cent. The process was repeated with an exactly similar result. This corresponds with 'Pharmacographia,' which gives "5 to 6 per cent." as the ash of genuine saffron. Ten grains were then placed under a bell jar and allowed to dry until the weight became constant. The loss was found to be ·25 grain, thus bringing up the ash of a thoroughly dry specimen to 5·12 per cent.

The suspected saffron was very dry; but there was nothing in the colour to indicate the presence of mineral matter. There was no perceptible effervescence on the addition of dilute HCl, either in the powder or the saffron, proving absence of $CaCO_3$. Ten grains of the saffron, freed as much as possible from powder by shaking and rubbing, yielded 2 grains, equalling 20 per cent. of ash, showing 14·88 per cent. of adulteration, even after being freed from all loose powder, when compared with a dry specimen of pure saffron. Ten grains of the loose powder (containing a small quantity of saffron) were then incinerated and yielded 6·5 grains of ash, the bulk of which was insoluble in boiling HNO_3, and gave the characteristic flame of barium. An attempt to ascertain the exact nature of the ash from a further 10 grains of powder was frustrated by an unfortunate accident resulting in the loss of the whole. The remaining saffron and powder were then incinerated and the ash analysed with results as given below. This ash

of course contains a proportion of normal ash, but the source of adulteration is proved beyond doubt.

Constituents of ash expressed as parts per 100:—

$BaSO_4$	64·28
$CaSO_4$	14·57
Al_2O_3*	10·71
Salts of K and Na	9·28
	98·84

Remarks.—It is of course impossible to accurately estimate the amount of adulteration, but I think it may be safely set down at from 25 to 30 per cent. I regret that I did not first make a microscopical examination, for although a large quantity of the powder must have fallen off, still sufficient was left on to have been indicated by the microscope. Both these samples were from houses of the highest standing, and in each case the top market price was paid, the adulterated specimen costing 50*s.* a few months ago and the pure 48*s.* per lb. in January last. Another proof is thus afforded, that neither the price paid nor the reputation of the wholesale house is at all times a sufficient guarantee of genuineness.

CONVALLARIA MAJALIS (LILY OF THE VALLEY).†

BY DR. SQUIBB.

Dr. Edward Drummond, of Rome, writes to *The British Medical Journal* (see No. 1194, November 17, 1883, p. 970), that he has lately met with an account of the use of this drug, in cardiac disease, as far back as the commencement of the seventeenth century, in an old Italian book of 'Commentaries on the Materia Medica of Dioscorides,' by Dr. Pietro Andrea Matthioli, published in Venice in 1621, and Dr. Drummond gives the following interesting translation:

"The Germans use lily of the valley to strengthen the heart, the brain, and the spiritual parts, and also give it in palpitation, vertigo, epilepsy and apoplexy; also as a remedy for the bites and stings of poisonous animals; to quicken parturition; and for inflamations of the eyes. For this purpose they are wont to prepare the wine from the flowers at the time of the vintage; and then infuse them in old wine for forty days in the sun, and subsequently distil and re-distil (but not many times), along with lavender-flowers, rosemary and other aromatics. They then preserve it as one of the most precious things to be found amongst medicines, and they call it 'aqua aurea,' and preserve it, in vessels of gold and silver, against sudden attacks. They even believe that, given to persons actually *in articulo mortis* it is able to prolong life for several hours. In this, however, they are not unfrequently deceived, as I have myself witnessed."

In the above translation it must not be taken for granted that the words "distil and re-distil" had their present meaning, for it is highly probable that they had not. Referring to Richardson and other authorities, it will be found that "to separate drop by drop," was formerly taken in a different sense, and had no necessary relation to rising in vapour and being condensed, or even to heat in any form. By the quotations given in Richardson, its present signification from some former more literal one can easily be traced, and in this translation it should probably be read as "percolate and repercolate" after the forty days' maceration.

Hence, it is probable that convallaria has been continuously used in medicine for several hundred years, and that its action on the heart has been long known. Its more modern and rational use in medicine, however, does not date back, so far as the writer knows, farther than a paper on the subject by Prof. Germain Sée in the *Bull. Therap.* for July, 1882. In connection with M. Hardy he investigated its physiological and therapeutic action at length, and very important and definite results were reported. Its effects on the heart and arteries, although similar to those of digitalis, were not identical, and were not produced in the same way, while it was free from some of the inconveniences and disadvantages of digitalis. It was not cumulative and explosive, as digitalis was reported to be. It did not interfere with digestion, but was perfectly well borne, the appetite rather increasing under its use, while the intestinal action was also improved. The diminution of the heart's frequency, under normal conditions, amounts to 10 or 15 beats per minute. Irregularity, especially of nervous origin, is lessened. Sensations of pulsations in distal vessels—*e. g.*, in the head—are removed by it. At the same time the force of the cardiac action is increased. It has a powerful diuretic action, increasing the amount of urine to about three times its previous volume (From *The Lancet*, August 26, 1882, p. 327).

This paper attracted considerable attention, and was followed by others in France, Great Britain and America. All agreed upon the potency of the drug as a cardiac agent. Some regarded it as an equal, and others as an inferior duplicate of digitalis. Some found it diuretic, others not at all so, while in a very considerable number of the trials the results were negative until toxic doses were used. Long ago it had yielded to chemistry two glucoside principles of very different and somewhat antagonistic action, and these, convallarin and convallamarin, were used separately, and the latter was alleged to be the cardiac agent, but with these also, discrepant results were obtained. In a year from the time of Professor Sée's paper it seemed doubtful if the convallaria was not a mere duplicate of digitalis, with the great disadvantage of being by no means so well studied or so well tried, yet stimulated into use by fashion and novelty, and by advertising.

If only a simple duplicate of digitalis, the already overloaded materia medica was much better without it. But if it differed materially in either quality or quantity of action, and was more free from collateral disturbance, the materia medica could not afford to lose the chances offered by it.

At about this period of its career the writer received a note from a very careful and close observer, saying that he considered it a valuable agent, which could not take the place of digitalis in his hands, but which had a place of its own to which digitalis had been applied, but to which it is less applicable, and asking the writer to make a preparation of convallaria for critical trial. This was in the early spring of 1883, and there was no part of the plant to be had in the American market. From the character of the plant, and from various considerations developed by the uses of the extract from its various parts by M. Hardy and others, the writer concluded that the root, if taken at the proper time, would be by far the best portion of the plant for medicinal use, and that a well-made fluid extract of the root would be far the best representative of the drug,—far better than the so-called active principles which, when divorced from each other, were found to yield such discordant results.

A florist was found who had some fine beds under cultivation, and when the roots had fairly sprouted they were taken from the ground, cleaned and dried by a gentle radiant heat. In drying they lost just about 75 p.c. of their weight, this loss not varying more than 1 to 2 p.c. in four separate parcels. The dried root and sprouts were then ground so as to pass through a sieve of twenty meshes, and were made into a fluid extract which represented the dried root minim for grain.

As a rule, cultivated plants are not as active, medicinally, as wild ones, but this was the best that could be done. The menstruum used for exhausting the root at first proved not to be a good one, and yet this fluid extract, in the hands of several good observers, proved moderately

* This contained a very slight trace of Fe.

† Reprinted from *Ephemeris*, January, 1884.

effective, and some discrepancies in the published statements were shown to be probably due to the use of preparations of different makers, or of different materials.

Specimens of this fluid extract were sent to several good observers, and in course of a few months results were obtained which, although not fully sustaining the character of the drug, were yet sufficient to warrant a more extended usage. By this time a parcel of foreign wild flowers and flower stalk had arrived. These were made into fluid extract with a different and better menstruum,—namely, the diluted alcohol of the U.S.P. of 1880. It was, however, pretty plain from the sensible properties that this was not so active nor so good a preparation as that from the root, and therefore that the root collected at sprouting should be preferred. A very few therapeutic trials seemed to confirm this opinion, and by this time some foreign root arrived, was made up and distributed, and the supply of this has now been kept up for several months to all who applied for it, thus gradually extending the number of those who were using this preparation, and adding them to the much larger number of those who were using the preparations of other makers, and who had used these long before this writer took up the subject.

Up to this time several competent and careful observers, —free from the prejudice of novelty, and from the still more dangerous prejudice of basing general conclusions upon too few cases,—have reported their experience in a guarded way. This experience is still discrepant, and therefore difficult to state, so that perhaps all that can be safely said, is that the general kind and direction of the results show that convallaria is worthy of a more extended use before it can be either fully accepted or discarded. It may be pretty definitely said that it is not a simple duplicate of digitalis, nor is it adapted to supersede that important agent in any large number of cases. Yet its use may serve to differentiate or discriminate between cases which have hitherto been classed together and all treated by digitalis, because there was no other agent that was applicable to any of the class.

If the uncertain indications from the use of convallaria thus far be not mistaken, the best that can be hoped from it is that it may materially aid physicians in splitting up the digitalis class into groups, some of which may be better managed by convallaria. It is also among the possibilities, if not among the probabilities, that it may prove either or both a substitute and adjunct to digitalis. There are many conditions in which digitalis fulfils all the indications required of it, but in which it cannot be continued in sufficient doses to maintain the good effects without disturbing the stomach and thus interfering with nutrition. In such, or in some of such cases at least, it may serve as a substitute or alternate. In other conditions which seem to indicate the effects of digitalis, but in which that agent does no good, or cannot be tolerated, convallaria gives a chance of relief where there may have been less chance without it.

Two or three years of careful observation, in good hands, extended over large numbers of cases, without prejudice, and with earnest investigation, will be absolutely necessary to establish the true and lasting character of convallaria, and it is this consideration which induces the writer to add his supply of a well-made fluid extract from good material to those of other makers who long preceded him in supplying it.

The dose of convallaria is, of course, the quantity which will give the special or physiological effect, and this will be different in different cases. But the dose to begin with, and that which will be effective in some cases, is about 24 grains in the twenty-four hours. And as the fluid extract represents the drug minim for grain, the dose of that will be as many minims,—say 6 minims every four hours, or 8 minims three times a day,—the size or the number of the doses to be increased until some effect is obtained.

The fluid extract is miscible with water, and though it does not make a clear solution, the precipitate which settles out is probably but not certainly inert. A good way to administer it is to put a measured quantity in a wine glass and add as many teaspoonfuls of water as may make up the number of doses required when given from the same teaspoon. For example, a fluid drachm is measured into a wine glass, and seven teaspoonfuls of water, or wine, or diluted alcohol are added and the mixture well stirred. Then using the same teaspoon, and stirring well at each dose, if water be the diluent, it is given in teaspoonful doses, which will be nearly eight minims each, farther diluted if desired at the time of taking it.

If the drug is to have a fair chance, there can be very little doubt that a well-made fluid extract of the root collected at the proper season is the best form in which to use it. In all drugs, the active principles of which are neither alkaloids nor acids, but are of that indefinite class called glucosides for want of a better generic name, it is pretty certain that these glucosides do not fully represent the drugs,—nor even well represent them. And when two or more glucosides are obtained from the same drug, the doubt is much strengthened. No one knows,—be he ever so good a chemist,—where the molecules of complex organic substances will split until he tries them, and therefore what he gets is often empirical, and may be the result of his chemical process, so that a different process may give different results. For example, Walz, in 1858, obtained from convallaria two glucosides which he named "convallarin" and "convallamarin." Dilute acids again split both of these into other bodies by subtracting a molecule of sugar, and one of the resulting bodies, *minus* half a molecule more of sugar, leaves the formula of the other original glucoside. Hence the inference that neither convallarin nor convallamarin exist in the plant, but that they are the result of the splitting-up of more complex molecules by chemical means. No one has ever proved that either of them pre-existed in the plant, while the physiological action of the plant is not represented by the action of the two glucosides as given.

THE USE OF LITMUS, METHYL ORANGE, PHENACETOLIN AND PHENOLPHTHALEIN AS INDICATORS.*

BY ROBERT T. THOMSON.

(*Concluded from p.* 705.)

X.—Effect of the Phosphates of the Alkalies.

As the normal phosphate of potassium is generally found to the extent of 1 or 2 per cent. (it has even been found as high as 7 per cent.) in commercial carbonate of potash, it is a matter of great importance to know what proportion of the potash, existing as phosphate, is determined by standard acid. I found that the phosphates of potassium, sodium and ammonium acted in the same manner towards the indicators when titrated with standard acid, and will, therefore, only quote the double series of experiments made—the one with normal sodium orthophosphate (Na_3PO_4), and the other with the ordinary disodium hydrogen orthophosphate (Na_2HPO_4). The crystallized form of the former of these salts was prepared by dissolving a weighed quantity of the latter in boiling water, adding the proper proportion of hydrate of sodium, and allowing to crystallize out. After recrystallizing both of these phosphates, a portion of each was ignited to obtain the real amount of dry salt in each, and solutions made of such a strength that 50 c.c. contained in the one case 2·05 gram Na_3PO_4 (equal to 1·162 gram Na_2O), and in the other 1·775 gram Na_2HPO_4 (equal to ·775 gram of Na_2O).

When *litmus* was used in the titration of the normal phosphate, the blue colour remained intact until about 16 c.c. of the normal sulphuric acid were added, when it

* Read before the Chemical Section of the Philosophical Society of Glasgow, January 22, 1883, and reprinted from the 'Proceedings.'

became purple, and, on further addition, slowly passed into red, the change being complete at about 24·9 c.c. This is equal to ·772 gram of soda, which is practically two-thirds of the total soda. The point at which the red colour was fully developed could not be ascertained with any degree of accuracy, even when a solution of reddened litmus was used for comparison, as the change was so very gradual. The mono-acid phosphate consumed 12·4 c.c. of the standard acid, thus agreeing with the result of the normal phosphate.

Methyl orange gives as delicate an end-reaction as with hydrate of sodium. The results were slightly higher and nearer the truth than those obtained with litmus, 25·05 c.c. being required in the one case and 12·6 in the other.

Phenacetolin.—With this indicator the same number of c.c. were necessary as with litmus, and, like the latter, changes gradually in colour, so that the point at which excess of acid is added is somewhat difficult to catch. There is, however, a peculiar phenomenon to be noticed with regard to this indicator. The normal phosphate, like hydrate of sodium, only brings out the scarcely perceptible yellow colour; but, after the addition of about 11 c.c. of the normal acid, the permanent pink colour is formed. In fact, the first-named salt acts towards phenacetolin as if it were a mixture of hydrate and the mono-acid phosphate of sodium. The latter salt produces the pink colour at once.

Phenolphthalein again acts in an entirely different way to the other indicators. We have seen before that $NaHCO_3$, NaHS, and Na_2SO_3 are neutral to this indicator, and to these must now be added Na_2HPO_4; while $NaHSO_3$ and NaH_2PO_4 are neutral to litmus, methyl orange, and phenacetolin—$NaHCO_3$ and NaHS being alkaline, and not requiring to be decomposed by boiling before determining the alkali in them by test acid. It will be observed that, in each case, there is exactly an atom of sodium of difference, the phenolphthaleïn being invariably the weaker indicator.

In titrating the normal phosphate, 12·65 c.c. of the test acid were required to discharge the red colour in the cold, and 13·7 c.c. in the boiling solution, the mono-acid phosphate requiring only ·25 in the cold and 1·4 in the hot. In each case, on cooling and titrating back with caustic soda, the same result as was obtained at first in the cold solution was brought out. These results show that when phenolphthaleïn is employed, one-third of the soda in normal phosphate of sodium is estimated by standard sulphuric acid, and only a trifling portion of that existing as the mono-acid phosphate.

Table VII.

Results obtained in the titration of normal sodium phosphate and disodium hydrogen phosphate by normal acid.

Na_3PO_4 used for each test	. . . .	2·050
$=Na_2O$	,, ,,	. . . .	1·162
Na_2HPO_4	,, ,,	. . . .	1·775
$=Na_2O$	,, ,,	. . . .	·775

Name of Indicator.	Na_3PO_4.		Na_2HPO_4.	
	C.C. Normal Acid consumed.	Gram of Na_2O found.	C.C. Normal Acid consumed.	Grams of Na_2O found.
Litmus . . .	24·9	·772	12·4	·384
Methyl orange .	25·05	·776	12·6	·390
Phenacetolin (first change) .	11·0	·341	...	...
Phenacetolin (second change)	24·9	·772	12·4	·384
Phenolphthaleïn (cold). . . .	12·65	·392	·25	·008
Phenolphthaleïn (boiled) . . .	13·7	·425	1·4	·043

XI.—Effect of Silicate of Sodium.

A preliminary test was made of the value of litmus for the estimation of soda in silicate of sodium, by taking a quantity of hydrate of sodium of known strength, dissolving some silica in it, and then determining the soda. The exact amount of soda used was found, and the estimation made by litmus was taken as the standard of comparison with the results obtained with the other indicators. Five grams of commercial liquid silicate of soda were employed, and 15·05 c.c. of normal acid were consumed with litmus as indicator, the end-reaction taking place with great distinctness.

With *methyl orange* also a very distinct end-reaction was obtained, and 15·1 c.c. were consumed—a result closely corresponding with the former one.

Phenacetolin gave a dark pink colour with the silicate of sodium, but this became yellowish towards the end of the test, and the change was not very distinct. 15 c.c. of the acid were necessary, which doos not materially differ from the quantities obtained with litmus and methyl orange.

Phenolphthalein.—The red colour produced by the phenolphthaleïn was slowly destroyed on running the acid into the cold silicate solution, 12·7 c.c. only being required. When boiled, the colour returned, but was dispelled when 13·5 c.c. had been added. These results are considerably below the truth.

Table VIII.

Results obtained in the titration of silicate of sodium ($Na_2Si_4O_9$).

Name of Indicator.	C.C. of Normal Acid consumed.	Grams of Na_2O found.
Litmus	15·05	·466·
Methyl orange	15·1	·468
Phenacetolin.	15·0	·464
Phenolphthaleïn (cold) .	12·7	·393
Phenolphthaleïn (boiled).	13·5	·418

XII.—Effect of Alumina.

Soluble alumina, like silica, is seldom or never absent from caustic soda or potash. The experiments were made with an excessive quantity of alumina, the proportion used being equal to about 8 per cent. in an average strength of caustic soda. A quantity of pure hydrate of aluminium, equal to ·515 gram Al_2O_3, was prepared from alum by precipitation with ammonia. This precipitate was redissolved, reprecipitated, washed thoroughly, dissolved in 125 c.c. of normal caustic soda and made up to 250 c.c. with water. Fifty c.c. of this was employed for each test and contained ·775 gram of soda, and ·103 gram of alumina.

Litmus.—When litmus is used 25·25 c.c. of the normal acid were consumed, in place of 25 required when no alumina was present, nor did the end-reaction come out very distinctly.

Methyl orange.—After a little more than 25 c.c. of the acid had been consumed, the alumina was all precipitated, and then gradually dissolved, the pink colour at first produced being quickly dispelled as the acid combined with the alumina. A decided and permanent change occurred when 30·7 c.c. had been added. This gives ·951 gram of soda, as against ·775 really present, and if the difference be calculated to alumina it shows ·097 gram of the latter compound instead of ·103. It is thus evident that nearly the whole of the alumina has been estimated along with the soda.

With *phenacetolin* and *phenolphthaleïn*, the real amount of soda used was obtained. The only effect of the precipitated alumina is to obscure the end-reaction slightly.

Table IX.

Results obtained in the titration of aluminate of soda.

Na_2O used for each test . . . ·775 gram.
Al_2O_3 „ „ . . . ·103 gram.
$=Na_2O$ „ „ . . . ·186 gram.

Name of Indicator.	C.C. of Normal Acid consumed.	Grams of Na_2O found.
Litmus	25·25	·782
Methyl orange .	30·7	·951
Phenacetolin . .	25·05	·776
Phenolphthalein .	25·0	·775

XIII.—Effect of Nitrite of Sodium and Potassium.

A solution of nitrite of potassium was prepared by decomposing with chloride of potassium a known weight of nitrite of silver, which was precipitated from a solution of nitrite of sodium. Twenty c.c. of this nitrite of potassium liquor contained 1·7 gram of KNO_2, and this quantity, diluted to 100 c.c. was employed for each test. The nitrite was found to be quite neutral to litmus, phenacetolin and phenolphthaleïn. With methyl orange, however, the pink colour was not produced even after adding 30 c.c. of normal acid, but seemed to be destroyed at once by the liberated nitrous acid. Another quantity, containing ·085 gram of the nitrite in the 100 c.c., gave a pink colour with ·2 c.c. of acid, but this was slowly dispelled on standing a few minutes, leaving a pale yellow colour. Nitrite of sodium acts in the same way towards the indicators as nitrite of potassium. Nitrites are sometimes found in small proportion in caustic soda and potash.

XIV.—Determination of Soda in Borax.

The solution of borax employed contained 1·683 gram of pyroborate of sodium in 50 c.c., the quantity used for each test.

With *litmus*, the blue colour began to purple when 13 c.c. had been added, but the change was not complete until 16·65 in the one case, and 16·6 c.c. of normal acid in the other, had been consumed. This shows ·516 and ·514 gram of soda, as against ·516 really present. The end-reaction, however, is very indistinct.

Methyl orange is by far the best indicator for the estimation of soda in borax, and is indeed perfect in that respect. The change in colour at the end of the experiment was very sharply defined. The results agreed closely with those of litmus.

Phenacetolin.—Like litmus, the colour of this indicator slowly changes, and a good end-reaction is therefore impossible. The whole of the soda can be estimated by it.

Phenolphthaleïn is utterly useless for the purpose under consideration. The red colour disappears before half of the soda is determined in cold solutions. When boiled, a much higher result is obtained, but still very far below the truth.

Table X.

Determination of soda in borax.

$Na_2B_4O_7$ used for each test . . . . 1·683.
$=Na_2O$ „ „ . . . . ·516.

Name of Indicator.	C.C. of Normal Acid consumed.	Grams of Na_2O obtained.
Litmus	16·65—16·6	·516—·514
Methyl orange	16·7 —16·65	·518—·516
Phenacetolin.	16·7 —16·6	·518—·514
Phenolphthaleïn (cold) .	7·6 — 7·8	·235—·242
Phenolphthaleïn (boiled) .	11·0 —11·3	·341—·350

XV.—Determination of Free Sulphuric, Nitric, and Hydrochloric Acids.

It is quite plain from the results obtained when testing the behaviour of the sulphates, chlorides, and nitrates of the alkalies with the indicators under consideration, that these acids can be determined by a standard caustic alkali, excepting that ammonia cannot be used with phenolphthaleïn. Carbonate of sodium can be used in the cold if methyl orange is employed, and in the case of phenacetolin the caustic potash or soda should contain a little carbonate of potassium or sodium, so that the carbonate or bicarbonate will be formed when the end-reaction is reached, and the dark pink colour will be produced.

XVI.—Determination of Free Oxalic Acid.

A normal solution of pure oxalic acid was prepared, and 20 c.c. of this was employed for each test.

With *litmus* the end-reaction was very well defined, and exactly 20 c.c. of normal hydrate of sodium were consumed, thus giving exactly the amount of oxalic acid.

Methyl orange.—It has been pointed out by Lunge that methyl orange must not be employed when oxalic acid is titrated, and from the following test it is evident that it cannot be relied on. When 12 c.c. of the normal alkali were added the pink colour began to fade away, and was completely destroyed after the addition of 18 c.c.

Phenacetolin.—The addition of 19·8 c.c. produced a very faint pink colour, which was not fully developed till 20 c.c. had been consumed. This indicator cannot, therefore, be recommended as useful for the titration of oxalic acid.

Phenolphthaleïn, on the contrary, works admirably, the end-reaction being as delicate as with the mineral acids. The result agreed with that of litmus.

Table XI.

Determination of oxalic acid.

$H_2C_2O_4$ used for each test . . . ·900 grams.

Name of Indicator.	C.C. of Normal NaHO consumed.	Grams $H_2C_2O_4$ found.
Litmus	20·0	·900
Methyl orange .	18·0	·810
Phenacetolin . .	19·8	·891
Phenolphthaleïn .	20·0	·900

XVII.—Determination of Acetic Acid.

The sample of acetic acid in which the free acid was determined showed a specific gravity of 1·0472 at 15° C., which is equal to, according to Oudemann's table, 35·02 per cent. of $HC_2H_3O_2$. One hundred grams of this acid were made up to 1 litre with water, and 50 c.c. used for each titration, the caustic alkali used being standardized with normal sulphuric acid.

Litmus.—On adding the normal caustic soda, the red colour remained intact, but towards the end of the experiment became purple and almost blue before the end-reaction was accomplished. The last change in colour could only be observed by comparison with a blue litmus solution of the same strength as the liquid operated upon. 29·15 c.c. were consumed both with this experiment and with one tested with litmus paper, 1·749 gram of acetic acid being obtained in each case.

Methyl orange is totally useless as an indicator in the estimation of acetic acid, only 3·5 c.c. of the alkali being consumed.

Phenacetolin.—The addition of 28 c.c. produced a pale rose colour, but the change was very undecided. This indicator is not adapted for this purpose.

Phenolphthaleïn is well fitted for use in the estimation of free acetic acid by caustic soda, as acetate of sodium is perfectly neutral to it, while that salt is alkaline to litmus. Several tests gave 29·2 c.c. of normal alkali consumed—these results being slightly, but quite distinctly higher than those obtained with litmus. The end-reaction is as delicate and sharply defined as in the determination of the mineral acids. If the solution in which the acetic acid is to be determined is dark coloured (as in some vinegars), it may be highly diluted, as dilution has little or no effect on the delicacy of phenolphthaleïn.

Table XII.

Determination of acetic acid.

Name of Indicator.	C C. of Normal NaHO consumed.	Grams of $HC_2H_3O_2$ found.
Litmus	29·15—29·15	1·749—1·749
Methyl orange .	3·5	·210
Phenacetolin . .	27·8	1·668
Phenolphthaleïn .	29·2—29·2	1·752—1·752

XVIII.—Determination of Tartaric Acid.

1·5 grams of pure and dry tartaric acid were used for each experiment. The solution tested with *litmus* as indicator began to get purple after the addition of 19 c.c. of normal caustic soda, but the change to blue was not complete till 20 c.c. had been consumed, the tartaric acid found being exactly equivalent to the quantity taken. As with oxalic and acetic acids, *methyl orange* gives very low results, 16 c.c. only being required to dispel the pink colour. The tartaric acid found by *phenacetolin* was slightly, but perceptibly, under the truth.

Phenolphthaleïn in this case, as with acetic acid, is the only perfect indicator among these four. Although the results obtained are much the same as those with litmus, the unimpaired delicacy of the end-reaction gives phenolphthaleïn a great advantage over the former indicator.

Table XIII.

Determination of tartaric acid $H_2C_4H_4O_6$ used for each test, 1·5 gram.

Name of Indicator.	C.C. of Normal NaHO consumed.	Grams of $H_2C_4H_4O_6$ found.
Litmus	20—20	1·500—1·500
Methyl orange .	16	1·200
Phenacetolin . .	19·85	1·488
Phenolphthaleïn .	20—20	1·500—1·500

XIX.—Determination of Citric Acid.

The sample used for the following tests was found to be free from impurity; but, as the water of crystallization varies to some extent, it was determined by drying for about twelve hours between 50° and 60° C., and then gradually raising the temperature to 100°. 8·53 per cent. was obtained, which is slightly lower than the theoretical proportion, 8·57 per cent. As 14 grams were made up to 200 c.c., 20 c.c. contained 1·2806 gram of dry citric acid ($H_3C_6H_5O_7$), this being the quantity operated upon. The normal caustic soda was standardized by normal sulphuric acid.

Litmus seems still to be considered the best indicator for the estimation of free citric acid, but it is a very defective one. In the first place, it gives a very indefinite end-reaction, and, in the second, the normal citrate of soda formed during titration is so alkaline as to preclude the use of sulphuric or any other mineral acid in the standardizing of the caustic soda. Pure citric acid must in that case be employed as the standard, and this entails the testing for impurities, and the tedious estimation of water described above. Allen, in his 'Commercial Organic Analysis,' vol. i., p. 263, noticing these points, observes that neither logwood nor cochineal give sharp end-reactions, and recommends the use of carefully prepared litmus paper. In the two tests I made both litmus solution and paper were used, the last change in colour of the former being observed by placing it side by side with a litmus solution of equal strength, to which a little alkali had been added. The results were identical, 19·7 c.c. of the normal alkali being consumed in each case. This shows ·02 gram too little of citric acid, and is to be attributed to the alkalinity of the citrate, as sulphuric acid was made use of in testing the standard caustic soda.

Methyl orange and *phenacetolin* were found to be of no value in the titration of citric acid, 9 c.c. being consumed with the former and 17 with the latter.

Phenolphthaleïn.—This indicator is again distinguished from the others by its great delicacy in the determination of free citric acid, as it is in that of tartartic and acetic acids. Several tests were made, and in every case 20 c.c of the normal acid were consumed, giving results extremely close to the real amount of citric acid present, Phenolphthaleïn has thus two advantages over litmus for the determination of citric, tartaric and acetic acids; first, it gives a sharply defined end-reaction, and, second, sulphuric acid can be employed in standardizing the caustic soda.

Table XIV.

Determination of citric acid, sulphuric acid being used for the standardizing of the normal caustic soda.

$H_3C_6H_5O_7$ used for each test . . . 1·2806 gram.

Name of Indicator.	C.C. of Normal NaHO consumed.	Grams of $H_3C_6H_5O_7$ found.
Litmus	19·7—19·7	1·2608—1·2608
Methyl orange .	9·0	·5760
Phenacetolin . .	17·0	1·1000
Phenolphthaleïn .	20·0—20·0	1·2800—1·2800

Litmus and *phenolphthaleïn* were further tested with a sample of lime juice, in order to make certain that a similar difference in result would be brought out when these indicators were applied to the determination of citric acid in this substance. Of course the other free acids existing in the juice would be included in the result. Ten c.c. of the sample, measured at 15·5° C., were employed.

Litmus paper was used as indicator, as the yellow colouring matter of the lime juice darkens so much as to make litmus solution useless. 13·0 and 13·05 c.c. of normal alkali were consumed, which give 36·5 grains of dry citric acid per ounce, 30 grains per ounce being the Board of Trade standard.

Phenolphthaleïn.—With this indicator the most convenient quantity to use is 10 c.c. of the juice, diluted to 150 or 200 c.c. As the yellow colouring matter becomes darker towards the end of the experiment, the end-reaction is not quite so delicate as in a colourless solution, but can still be recognized without the least difficulty. 13·25 c.c. of the normal alkali were consumed in each case—these results being equal to 37·1 grains of dry citric acid per ounce.

Table XV.

Determination or free acids in lime juice.
10 c.c. of sample used for each test.

Name of Indicator.	C.C. of Normal NaHO consumed.	Grains of $H_3C_6H_5O_7$ per ounce.
Litmus	13·00—13·05	36·40—36·54
Phenolphthalein .	13·25—13·25	37·10—37·10

AMERICAN DRUGS.*

BY J. MOELLER,

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(*Continued from page* 704.)

5. HERBA FRANKENIÆ GRANDIFOLIÆ (YERBA REUMA).

The drug consists of all that part of the plant above ground, gathered at the time of blooming. The stem is round, the leaves are disposed in alternate pairs opposite one another. They are spathulate, fleshy, smooth-edged and with but a single nerve. At first they are hairy, as are also the calyces and youngest shoots, but as

* Reprinted from the *Therapeutic Gazette*.

the leaf grows older it becomes smooth, except at the base, where a few remaining straggling hairs give it

Fig. 8.—Branch of *F. grandifolia*: nat. size.

the appearance of being slightly ciliated. Each leaf-sprout ends in a flower (Fig. 8), and the axils of the short, whilst the terminal blossom are generally furnished with two flowers, which are in reality shoots of a higher order, with contracted internodes. The terminal two pairs of leaves form a border around the tubular four-ribbed and four-toothed calyx, from which the four pale-red petals scarcely protrude at all.

The plant when dried has a greyish-green colour, similar to the oil-willow (*Elæagnus*), but less silvery. It is odourless and tastes saltish, owing to an external saline incrustation, freed from which the plant proves tasteless.

The family of Frankenia, to which the yerba reuma belongs, is the only representative of the order of Frankeniaceæ, to which the indigenous families of Cystinaceæ, Droseraceæ and Violaceæ belong. *Frankenia grandiflora* (Cham. and Schl.) is indigenous to the sea-coast of lower California where grass grows but in winter. It is found even on the mountain slopes. It is a small, scrubby plant, having a short stem with but few branchlets, and is about 15 cm. in height. It is vulgarly known as "river grass" and was known to the early Spanish settlers as being capable of affecting the mucous membranes, a quality which it owes to the tannin and sodium salts which it contains.

Fig. 9.—Forms of *Jacaranda procera* leaves: nat. size.

Professor Carl Jungk (*Therapeutic Gazette*, 1882, p. 60) found:—

	Per cent.
Tannin forming a bluish precipitate with iron salts, nearly	6·000
Chloride of sodium	28·049
Chloride of magnesium	1·350
Sulphate of lime	1·474
Sulphate of sodium	2·547

It is claimed that the liquid extract, properly diluted, which this plant furnishes, is used with satisfactory results in cases of chronic catarrh of the nose, fluor albus and gonorrhœa, in its latter stages. It has also been given internally for catarrh of the digestive organs, but as yet the results obtained in this direction are not very definite even to the Americans.

6. FOLIA JACARANDÆ PROCERÆ (CAROBA).

The dried, well-preserved leaves are bright-green or brown in colour, varying in form and size (Fig. 9), but in no other particular, and therefore evidently all belonging to the one family. They are inclined to develop unsymmetrically, particularly towards the base of the leaf. They are more or less leathery, slightly bent downwards at the edges; the upper surface is smooth, the lower covered with a velvet-like covering, particularly towards the edges and along the nerves. The leaf-stems are very secondary nerves form slight anastomoses towards the rim of the leaf.

Microscopic Characters.—The cuticular covering on the upper surface of the leaf is several times stronger and thicker than that on the lower surface. The palisade layer is single, the mesophyll rather thick. The epidermis (Fig. 10) is, on both sides, composed of large irregular cells with many pores on the lower surface. These leaves are characterized by two kinds of trichomata which occur on both sides.

The first of these are conical thread-like hairs composed of but one cell, broad at the base, tapering gradually to a blunt point, 0·5 mm. and more in length, and thick walled; the others are round, cake-shaped glandular hairs, composed of six to eight cells arranged together in a star-shape (0·05 mm. in diameter) with a yellowish amber-like secretion.

The drug is odourless; when chewed it has a bitter and astringent taste. In 1828, Dr. Schimmelbusch first introduced it into Germany, where, however, it was soon forgotten. Some fifteen years ago it was again heard of there as a blood purifier and diuretic. It was also recommended, to be used both internally and externally, in syphilis. In 1867, Hager (*Pharm. Centralh.*, 1867, No. 3) described a sample sent him from St. Petersburg, consisting of five different and apparently entirely distinct sorts of leaves, whence he concludes that these leaves

belong to five different Bignoniæ. I do not think from the specimens before me that this conclusion is warrant-

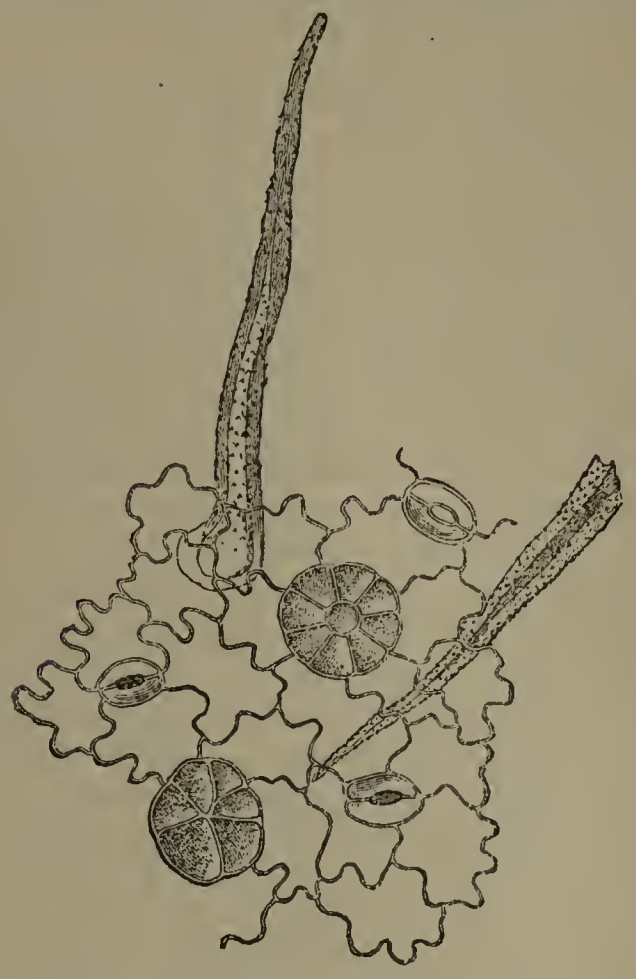

Fig. 10.—Aspect of under side of leaf.

able, though it may be quite probable that the gatherers may occasionally throw similar leaves of different, but closely allied plants, into the same basket. *Jacaranda procera*, Sprengel (*Bignonia copaia*, Aubl., *Bignonia caroba*, Vellos, *Kordelesteis syphilitica*, Arruel), a Brazilian bignonia, called by the inhabitants caroba, carobinha, caroba mirim, caroba minda, is said to be the parent plant.

Theo. Peckolt has subjected the bark and leaves of the caroba to a very searching analysis, and has found that the former possesses more carobin, the latter more aromatic substances. His analysis resulted as follows:—

	Leaves	Bark
Cellulose and water	853·304	885·090
Crystallized carobin	1·620	3·000
Carobic acid, crystallized.	0·516	—
Steocarobic acid, crystallized.	1·000	—
Carobon, balsamic resinous acid.	26·666	—
Caroba resinous acid, odourless	—	2·000
Resin of caroba, tasteless and odourless	33·334	5·000
Caroba balsam	14·420	—
Bitter substance	2·880	2·830
Extractive substance	10·550	19·530
Extractive substance and organic acids	10·000	—
Caroba tannic acid	4·390	4·800
Glucose	—	1 650
Chlorophyll and wax	9·000	—
Albumen, starch, dextrin, salts	32·120	76·100
Calcium malatum.	0·200	

O. Hesse (*Leibig's Ann. d. Chemie*, 1880, p. 150) has made diligent though futile search for alkaloids in these leaves, coming to the conclusion that their entire efficacy has been considerably exaggerated. It had been supposed that they were descended from a common ancestry with the Pareira bark, an error probably born of the fact that both possess like qualities as a drug.

Peckolt's "carobin" forms felt-like glittering crystal needles, is odourless, and has an alkaline taste, with a slightly bitterish after-taste. Heated upon a platinum foil, it melts into a clear liquid, and burns with a bright flame, leaving no residue. It cannot be sublimated. It is insoluble in ether or alcoholic ether but is very slightly soluble in cold water or cold alcohol; easily soluble, however, in boiling water or hot alcohol, again crystallizing upon cooling. The solution will turn turmeric paper brown. The foregoing table shows that the amount of alkaloid in the bark is nearly double that found in the leaves, whilst the former is wholly destitute of all aromatic substances. Since it is the leaves only that are in use as a drug, we must look upon their aromatic component parts as representing their most prominent curative properties. The name caroba has an unusually manifold signification. With us, as is well known, the fruit of *Ceratonia Siliqua*, L., carobs or carubs, a sort of acorn (*Pistacia terebinthus*), are known to commerce as carobs or carobbs. In Brazil they have also:—

Caroba de flor verde; *Bignonia quinquefolia*, Vell. (*Cybistax antisyphilitica*, Mart.).

Carob-assú: *Jacaranda subrhomba*, DC.

Caroba boanca: *Sparattosperma lithontripticum*, Mart.

Caroba do campo: *Bignonia nodosa*, Mans.

Caroba des paulistas: *Jacaranda oxyphylla*, Cham.

Caroba guyra: *Bignonia purgans.*

Caroba preta, carob-assú.

All the different kinds of carobs are used by the Brazilians as medicaments, and Peckolt (*Zeitschr. d. allg. österr.*, Ap. V., 1881, page 480) thinks they are in every way preferable to sarsaparilla. A certain syphilitic affection of the skin prevalent amongst the negroes, and called Bobas, is often cured by means of a preparation called "Massa de Dr. Alves Carneiro," which is composed as follows:—

℞ Fol. carob. pulv.	90·0
Sarsaparillæ pulv	30·0
Fol. sennæ pulv.	30
Calomelanos	2·0

Syrup. simpl. q. s. ut. ft. electuar.

D. S. A teaspoonful morning and evenings with caroba tea.

Peckolt prescribes caroba balsam in doses of 1·0 g. as a tonic, and also as an external application for wounds; carobon in doses of 0·1 g. for affections of the skin, and carobin in doses of 0·5 g. for syphilitic and scrofulous affections.

These mere indications are not sufficiently comprehensive, nor have any pharmacodynamic experiments as yet been published on this subject that can pretend, in any reasonable degree, to satisfy the demands of science and research, which is indeed a rather remarkable circumstance in view of the reputation and popularity of this drug.

(*To be continued.*)

REFINING OF SHELLAC.*

BY E. L. ANDÉS.

The crude shellac is refined in the following way:— One and a half kilos. of soda are dissolved in 45 litres of water contained in a small boiler or kettle; 5 kilos. of the crude shellac are added in small quantities at a time. This turbid solution has the characteristic odour of shellac and a violet-red colour. The liquid is boiled for a few minutes, and, while hot, a wooden air-tight cover is cemented on the vessel. When the liquid is quite cold, the cover is removed, and the thin cake of fat which is found on the surface is separated. The solution is filtered through linen, the clear filtrate slowly decomposed with dilute sulphuric acid, and the resulting shellac washed with water until no acid reaction remains. The washed resin is now pressed and melted in boiling water, when it can be shaped with the fingers. This shellac is cooled in water containing glycerol, and, when hard, is dried. The refined shellac forms yellowish-white glistening tufts or bars which, when dry, are yellowish-brown; it should entirely dissolve in alcohol.

* From *Arch. Pharm.*, [3], xxi., 291. Reprinted from the *Journal of the Chemical Society*, March, 1884.

THE PRESS ON THE SALE OF POISONS.

From the SATURDAY REVIEW, *March* 8.

Public attention has been attracted so much of late to Ministerial messes, to African massacres, and Fenian explosions, that there seems to have been very little to spare for a crime probably unequalled in England since the days of Palmer at Rugeley. A series of the most atrocious murders has been detected at Liverpool, where for a paltry gain, two women have poisoned their nearest and dearest relatives. They were found out after a long career of probable but unascertained crime. One of them it is reported, confessed as much. There must, we feel sure, be numberless undetected cases as long as the sale of poisons is permitted as at present. The Liverpool poisoners might have gone on with their operations for years to come if it had not been that long impunity produced carelessness and carelessness clumsiness. So far as the law would have interfered they need never have experienced any difficulty in obtaining their supply of drugs. That they have been found out, convicted, and executed is a small matter. They can be hanged but once, and the investigation and trial went into but one case. But the whole affair reminds one of the danger incurred by the public owing to the present laws regulating the sale of poisons. The question of insurance is a serious one, but we need not enter upon it here. The question of the sale of poisons is a much more serious one, and just now the law is practically in abeyance as regards it.

We are therefore glad to hear that Government has taken up the subject. A Bill is before them, and will shortly be brought into the House of Commons. The Act of 1868 is a dead letter, yet it is the only protection we have at present. The older and more respectable chemists, with their full pharmaceutical licences, are being superseded by stores, grocers, and all kinds of unauthorized dealers. The old-fashioned chemist could and did know or guess what was in these compounds; he could and did exercise his judgment in selling them, so that no harm done by them could be brought home to him. But the association which manages a co-operative store, or the uneducated dealer in drugs, or the grocer's assistant who can now sell them, are altogether in the dark, and may provide a sick man with the very drug required to "complete the case." There is much, in fact, to be said against the entire system of stamping the so-called patent medicines. The royal arms on the cover give them a kind of Government sanction, which undoubtedly imposes on the uninformed. That the same paternal and benevolent body which insists on vaccination, pure milk, and sanitary arrangements in general, gives its official stamp to many dangerous narcotics and to virulent poisons supposed to counteract gout, cancer, and other diseases is enough with many people to recommend them as innocuous. Professor Attfield wisely suggests, and not an hour should be lost in adopting the suggestion, that the stamp should be abolished, and that the loss of revenue thus occasioned should be made up in a greatly increased charge for licences to sell patent medicines. As a fact, there is no real patent. If the inventor of a nostrum was obliged to register the drugs he uses and the process, as in ordinary patents, the case would be very different. Some old medicines were thus entered on the patent books years ago. But the modern quack medicine is a secret. We cannot expect every one who sells a bottle with a Government stamp on it to go to the expense of having the stuff analysed. Patent medicines may remain as they are—proprietary; but they should not have the sanction implied—in the minds of the general public, at least—in bearing a Government label. A patent medicine containing poison should be labelled poison, and it should be labelled, not by the retailer, but by the original maker, so that in case of harm ensuing from the use of it the retailer may have his remedy against the maker. There is no inherent difficulty in such an enactment. The retailer of watered milk, if he is fined, can recover against the producer under the Sanitary Acts; and it would be easy to make a similar arrangement in the case of dangerous medicines.

There is another point to which attention should be directed. At present the wholesale houses have no restriction placed on the sale of any poison which they can sell to the retailer or to a medical man. The case of Dr. Lamson will be remembered. He applied to a chemist for aconitine. It was refused; and he then went to a wholesale house in the City and obtained what was sufficient for his purpose. True it was only one grain; but that would be enough to poison half a dozen adults. This was, therefore, strictly speaking, a wholesale transaction, and as such was very severely commented upon by the learned judge who tried the case at the Old Bailey. The greatest difficulty, however, will be found in dealing with what are sometimes described as statutory poisons. These are a very frequent cause of accidents. A metal-worker sends out for a few pence worth of vitriol. It is probably brought him in a cup. It is set on the table among the children. The utmost danger is incurred. The action of vitriol is so pronounced that even a child is not likely to swallow much; but a poisonous dose of carbolic acid may be taken without any immediate inconvenience, and the number of fatal accidents from this cause alone is sadly on the increase. When a chemist sells it, he labels it; but the drysalter has it among his oils and varnishes, and sells it without a word of warning to the buyer as to its dangerous qualities. In cases like these, since we cannot prohibit the sale of drugs necessary in the arts, we should insist on their being at least labelled "Poisonous" as a warning. It is not possible for the law to prevent lawless people from committing crime, but it is very possible to mitigate the chances of accidents. If a man must have arsenic to commit suicide or murder, he will get it, like Mrs. Flanagan, from fly-papers, or perhaps from wall-papers. We can only deter him by the example shown at Liverpool on Monday. But the state of the law is to blame when a child swallows a mouthful of vitriol, or when sugar of lead is put into a pudding. We may go further, and refer to the enormous infant mortality caused by the administration of various kinds of soothing syrups. One well-known medicine of this kind is credited with a round dozen of deaths annually. Scarcely less shocking is the mortality from over-doses of narcotic poisons among adults, and it is reported to be largely on the increase. These are things which should not be allowed to happen, yet they do happen constantly and are reported daily in the papers. It is much to be hoped that the Bill when it comes before the House may be found to contain full provisions on these points, as well as on the licensing question and the other incidental matters of minor importance. The State is directly to blame when a preventable accident occurs, and it is indirectly to blame when the posioner finds the drug he wants ready to his hand.

The Pharmaceutical Journal.

SATURDAY, MARCH 15, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE NEW FRENCH CODEX.

AFTER three or four years devoted to the labour of revision, a new edition of the Codex Medicamentarius, or French Pharmacopœia, has just been published and will be binding on the pharmaciens of France on and after to-day. Intercommunication between the countries lying on either side of the English Channel has in recent years undergone such enormous development that this work will possess more of interest even than its predecessor for British pharmacists, many of whom will have to dip into its pages for the information necessary to enable them to dispense prescriptions that will be soon coming into their hands in the ordinary course of business. Even where this is not the case, an intelligent curiosity will be roused as to the nature of the new national pharmaceutical text-book of a neighbouring country, in which the art of pharmacy has been so successfully cultivated, and we hope to be able to meet this by devoting a short series of articles to a summary of the book, the first of which will be found on another page. As compared with Germany or the United States, it cannot be said that France, any more than our own country, is troubled by excess of restlessness or enterprise in those who are the arbiters as to the time when a revision of the Pharmacopœia becomes necessary. It appears that the present is only the fourth edition of the work published under the authority of a law that dates so far back as 1803. The first edition was published in 1818, the second in 1837, and the third,—that which now becomes obsolete,—in 1866, one year before the present edition of the British Pharmacopœia appeared. There is evidence, however, that in France, the fact is at last recognized that such intervals are too long and too irregular; for in the report upon which the decree for the present revision is based, it is expressly stated that the consequences have been "grievous." It is pointed out that a publication of this nature is essentially progressive: "the incessant study of the thera-"peutic properties of various substances, simple or "compound; the researches of naturalists and the "labours of chemists furnish every day new agents "or allow of the perfecting of preparations already "known; hence the necessity for revising this "work at predetermined periods."

In respect to one subject, the constitution of the body to be entrusted with the revision of a national Pharmacopœia, the appearance of the Codex is most opportune, coming as it does just at the time when the pharmacists of this country are meditating to approach Parliament with a view of obtaining a coordinate position with medical practitioners in the Pharmacopœia Committee. It appears that according to the "loi de germinal an XI.," which strictly speaking should regulate the preparation of the Codex, it is provided that the Commission should be composed of Professors of the Faculty of Medicine and Professors of the School of Pharmacy; but in consequence of a report presented to King LOUIS PHILIPPE on the subject of the appointment of a Codex Commission in 1836, it was decided that "in order to increase the guarantees of knowledge and authority" the professors nominated to serve upon it should be selected from among the members of the Academy of Medicine. This arrangement was continued in the Commission that prepared the Codex of 1866, and the precedent thus established, might have been maintained in its successor. But the Ministers of Public Instruction and Fine Arts and of Agriculture and Commerce, in the report upon which the decree for the preparation of the present edition was based, expressly urged that this constitution of the Commission would be too restrictive and that in conforming to it too rigorously there would be a risk of losing the assistance of *savants* of considerable authority. It was also pointed out that the Commission of 1861 had been completed by the addition of a certain number of members of the Society of Pharmacy, with *voix consultative*, and it was recommended that a similar course should be then taken so that the pharmaciens of France should receive every desirable satisfaction. The Commission as eventually appointed consisted of the Medical Inspector-General (M. GAVARRET), who presided; the Director of the Paris School of Pharmacy (M. CHATIN), who was Vice-President; two officials of the Department of Higher Education; six Professors of the Paris Faculty of Medicine (MM. BAILLON, BOUCHARDAT, HAYEM, REGNAULD, GERMAIN SÉE and VULPIAN); six Professors of the Paris School of Pharmacy (MM. BAUDRIMONT, BOUIS, BOURGOIN, A. MILNE-EDWARDS, PLANCHON and RICHE); and six members of the Paris Society of Pharmacy (MM. BLONDEAU, who acted as Assistant Secretary, DUROZIEZ, JUNGFLEISCH, MARTY, SCHAEUFFELE and VIGIER). It needs but a glance at this list to perceive how fully it is in accord with the position taken up by the pharmacists of this country; for in it not only are the names of pharmacists associated, as such, in honourable fellowship with those of members of the medical profession, but even among the representatives of the medical faculty itself are to be noticed the names of men

upon whom pharmacy has as at least an equal claim with medicine. Indeed, those who were privileged to attend the International Pharmaceutical Congress in London in 1881 will remember that M. PETIT, speaking of this Commission, stated that the greater part of the work was being done by the pharmacists belonging to it, the medical men rarely attending the sittings. Moreover, the Society of Pharmacy, among whose ranks so many members of the Commission were found, found itself in a position to render assistance without any loss of dignity. It promptly divided itself into twenty-four sub-committees, each charged to report upon a special subject; the reports were afterwards discussed in general meetings of the Society and the results were communicated to the Commission. In the Preface to the new work the value of these communications is acknowledged in flattering terms. It is worth mentioning also that there is every probability that in future this arrange ment for profiting in France by the services of practical pharmacists will have a legal basis, since the Bill now before the French Legislature, as left by the Committee to which it was referred, provides for the presence on the Codex Commission of an equal number of professors in medical schools, professors in pharmaceutical schools and pharmacists engaged in practical pharmacy.

As it is proposed to review this work in a more detailed manner in another place it will not be necessary to enter into a close description of it here. It will suffice to say that considering the pertinacity and ability with which the idea of a Universal Pharmacopœia has been advocated by our *confrères* across the Channel this latest official pharmaceutical text-book of their own appears, upon a somewhat superficial examination, to show very little additional approximation towards the Pharmacopœias of other nations. The Codex remains—the Codex, with most of its known peculiarities and, may we say it, defects. An effort has been made to avoid the chaos involved in the previous edition by the scattering of eight or nine hundred articles through seventy-five chapters. But this is only a relative success and we venture to predict that for a long time to come the index will be the most frequently consulted portion of the work. The old form of nomenclature has been maintained, and this combined with an alphabetical arrangement brings together all the salts containing the same acid radical, a result which is, in our opinion, at least inconvenient in its consequences, since the salts of the same base,—quinine for instance,—are thus distributed at intervals through the whole section. Such points as these seem to be open to general criticism; but when we turn to the materia medica and the preparations we freely admit that the judgment of French experts as to the constitution of the French Codex is indisputable, and we shall be quite prepared to find that the pharmaceutical portion of the work is elaborated with the skill that has made French pharmacy famous.

THE ANNUAL DINNER.

A MEETING for making preliminary arrangements for this annual gathering was held at the Society's house on Wednesday last, and upwards of a hundred gentlemen having expressed their willingness to become Stewards, it was resolved that the Thirteenth Annual Dinner of the Members of the Society and their friends should be held on Tuesday, May 20, at the Holborn Restaurant, and that the price of each ticket should be one guinea. The tickets are to be obtained from the Honorary Secretary only.

The extra expenses of the dinner will be met by the Stewards, as last year, and as it is therefore desirable that that body should be not only representative, but as numerous as possible, it has been decided not to close the list of Stewards for publication until Wednesday, April 2.

A Committee, consisting of the President, the Vice-President, the Treasurer, Professor ATTFIELD, Dr. PAUL, and Messrs. FREDERICK BARRON, ISAIAH BOURDAS, E. NORTHWAY BUTT, THOMAS GREENISH, and WALTER HILLS, was appointed by the meeting and requested to make the necessary detailed arrangements. Mr. RICHARD BREMRIDGE was appointed Honorary Secretary to the Committee, and all communications respecting the dinner should be addressed to him, at 17, Bloomsbury Square.

An Evening Meeting of the North British Branch of the Pharmaceutical Society of Great Britain will be held on Wednesday next, in the Society's Rooms, 119A, George Street, Edinburgh, when a paper will be read on "Tincture of Hyoscyamus," by Mr. W. Gilmour, and two papers on "Spiritus Ætheris Nitrosi:" I. "Composition in Relation to Deterioration," by Mr. P. MacEwan; II. "Characters and Tests," by Mr. D. B. Dott.

* * *

From an official Statement of the Trade of British India that has just been issued it appears that the export trade in drugs of this dependency has doubled during the last five years, amounting in the year ending March 30, 1883, to about £130,000. As might be expected, the increase is due to the development in the trade in cinchona bark, which now represents about two-thirds of the total exports. During the last year the quantity of bark exported reached 641,608 lbs., whilst seven years previously it only amounted to 72,452 lbs. Madras contributed most largely to swell the exports, the cultivation of cinchona in that presidency being more extensively carried on in private estates than in Bengal, where the principal cinchona estates are the property of the Government, which reserves a large proportion of the bark produced for local alkaloid manufacture. Most of the bark hitherto exported has come to London, but the demand from Italy for Indian bark is increasing. The total out-turn of cinchona bark from the Government plantations in India during the year 1882-3 was 527,199 lbs. In Sikkim these plantations cover 2294 acres and contain upwards of five million plants. The Nilgiri plantations cover 847 acres and contain about a

million plants. The private plantations in Sikkim are estimated to extend over 331 acres and possess over six hundred thousand plants. In the Nilgiris cinchona is cultivated in combination with coffee on private estates, but no returns exist as to the extent. In Coorg also there are more than a thousand acres under cultivation, containing another million plants.

* * *

The local manufacture of alkaloid, referred to in the previous paragraph, appears to be affecting seriously the import of quinine from Europe into India, as last year it fell to 7585 lbs. from 10,615 lbs. in the previous year. As matters now stand, it is officially stated in this report that imports of quinine on account of the Government have already practically ceased, and an opinion is expressed that in course of time quinine will be no longer imported into India, since that country will be able to supply all her own wants from the plantations of Darjeeling and the Nilgiris.

* * *

We learn from this same report that lac dye, once an important item in Indian trade, is disappearing from the exports, under the influence of the competition of other dyes. Lac is exported chiefly as shell-lac, and to a smaller extent as button-lack. Stick-lack, which is the unmanufactured form of lac, is now hardly exported. Another dyeing material, safflower, the cultivation of which once constituted an industry of some importance in Bengal, has also been almost driven out of the field by the competitors that have been pitted against it by modern science.

* * *

It would appear, however, that the chemical dyes are not everywhere to have all their own way, since the Government of Persia has issued a decree prohibiting the importation of aniline dyes into that country, on the ground that they have been found to exercise an injurious effect upon the textile industries. It is believed that if this prohibition be strictly enforced, Persian carpets will recover their former reputation in the European markets for durability of colour.

* * *

In a report from Mr. Consul Mansfield, of Caracas, on the mining districts of Venezuela, he states that the *Dipterix odorata*, which yields the fragrant seed commonly known as the tonquin bean, abounds in the forests of the Caracas district, where the trees grow to a considerable size. The first crop of "beans" is yielded in the third year of the plant, the fruit bearing some resemblance to a small mango, and containing in its centre the "bean," which emits a powerful odour. A full crop is not yielded until two years later. The tree is said to grow in any climate in Venezuela, but to attain a greater perfection in warm temperate zones, alike removed from parching heat or the sharp mountain breezes. Last year's crop was a large one; Venezuela alone exporting five thousand quintals at an average price of 3½ francs per pound. It is estimated that the bean is used for curing and flavouring eight million quintals annually of tobacco exported from the United States. The vanilla also grows wild in many of the forests of Guayana. It may be remembered that a sample of Guayana vanilla was mentioned as having been shown at the Vienna exhibition last year.

In the course of a lecture on "Science and Singing," delivered by Mr. Lennox Browne, F.R.C.S., at the last meeting of the Society for the Encouragement of the Fine Arts, reference was made to the statements that have been published in respect to a means for improving the voice by the use of a mixture containing peroxide of hydrogen and ammonia, which is said to produce artificially the effects of Italian air. Mr. Browne stated that even if peroxide of hydrogen were capable of producing the alleged wonderful effect upon the voice, he had failed to detect by delicate chemical tests the presence of that compound in a sample of the mixture obtained direct from the inventor, and that although the mixture contained a quantity of free ammonia, and that gas is capable of acting as a temporary stimulant, in his opinion such an effect would be followed by relaxation, which was likely to cause injury to the voice. He also added that this opinion, based upon physiological and therapeutical experience, had been confirmed by actual experiments upon vocalists.

* * *

In the Fourth Annual Report of the State Board of Health, Lunacy and Charity of Massachusetts, the body whose proceedings have recently disturbed the wholesale druggists of Boston, a considerable prominence is given to the subject of the adulteration of food and drugs. In an appendix extending over nearly a hundred pages, Professor Sharples discusses the general subject, and incidentally expresses the opinion that outside the single article of milk injurious adulteration is by no means common, and that fraudulent adulteration is but little more so. It may be mentioned that the Massachusetts Adulteration Act authorizes this Board to spend annually a sum not exceeding three thousand dollars in carrying out its provisions, two-fifths of which is to be spent in the enforcement of the law against the adulteration of milk.

* * *

Some time ago we mentioned that, in compliance with a request from the Planters' Association, the Government of Ceylon had given permission that prescriptions might be made up for Europeans at the hospitals and dispensaries connected with the Medical Aid Ordinance, on the payment of a fee covering the cost. Some little friction, however, appears to attend the carrying out of this permission, since the dispensers at these Government establishments refuse to recognize as a prescription any document not bearing the signature of a medical practitioner, whilst the planters contend that the permission should be construed to include private recipes.

* * *

It may interest some of our readers in the North to learn that a "Revised Edition" of the List of Prices recommended by the Committee of the Midland Counties Chemists and Druggists' Association has just been issued. We presume that copies may be obtained from Mr. C. Thompson, the Honorary Secretary of the Association, Birmingham.

* * *

At the next meeting of the Chemical Society, on Thursday, the 20th inst., there will be a ballot for the election of Fellows. The papers announced are, "Note on the Preparation of Marsh Gas," by Messrs. Gladstone and Tribe; and "On the Action of Dibromo-α-Napthol upon Amines," by Mr. R. Meldola.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

On Wednesday, the 5th inst., the monthly meeting of the Council was held at three o'clock.

Present—The President, Mr. James E. Brunker, M.A., in the chair; Mr. H. N. Draper, F.C.S. (Vice-President); Drs. Collins and Montgomery; Messrs. John Evans, Grindley, Hayes, Hodgson, Simpson, Professor Tichborne and Mr. Wells.

The minutes of the last meeting were read and confirmed.

A letter was read from Mr. William J. Smyth, of 14, Newington Street, Belfast, asking whether he would be admitted to examination.

The President said Mr. Smyth applied to be admitted at the last examination, but the Certificate Committee did not feel at liberty to pass his certificate, because he had served in an establishment analogous to that of Mr. Hardy. The decision, however, which had since been arrived at in the case of Mr. Hardy covered that of Mr. W. C. Dobbin, who had signed Mr. Smyth's certificate; so that the reply to be given to Mr. Smyth was that he would be allowed to come in at the next examination.

On the motion of Mr. Hayes, seconded by Mr. John Evans, it was resolved that Mr. Smyth be informed that he may present himself at the next examination.

A letter was read from Dr. R. Crossitt, of Cookstown, county of Tyrone, asking whether the matriculation examination of the Queen's College, Belfast, which a Mr. Craig had passed, would be accepted in lieu of the Preliminary examination of the Pharmaceutical Society.

The President: The Registrar having made inquiries has found that this examination is accepted by the General Medical Council, therefore we must accept it under our bye-law.

The Registrar was directed to write to Dr. Crossitt accordingly.

A letter was received from Mr. James N. Hardy, defending the course of action which he had taken relative to opening a compounding department in the house of Beater and Co.

On the motion of Dr. Montgomery, seconded by Mr. Simpson, the letter was directed to be marked "read."

Dr. Montgomery moved, pursuant to notice, that the duties of the Visitors at the examinations should be defined. His object was to elicit the opinions of the members of the Council as to whether the Visitors should not take a more active part than they had hitherto done at the examinations. Should they act as the assessors who assisted in other examining bodies and give their opinions on any complications that arose? In the Apothecaries' Hall examination the assessor was present at the entire of it, and when it was over he took part with the examiners in deciding what the marks were to be. He did not mean to offer any positive proposal now.

The President: Would not the best course be to refer the subject to the Committee of Examinations for them to report on it? I think the introduction of something in the shape of an assessor would be very useful.

Mr. Grindley: Does the President of the English Society take part in the examinations?

The President: The President and another member of the Council of the English Society are always present at the examinations as well as the Inspector of the Board of Trade, who is assessor. The Lord Lieutenant has power to appoint a similar officer in this country but he has never done so. It might be well for the Committee to consider whether an application should not be made to the Lord Lieutenant on the subject.

The Vice-President said there were other matters also in respect of which he was sorry that their practice had not been assimilated to that of the English Society.

Mr. Grindley: Does the President of the English Society interfere in the examinations there?

The President: I cannot say that he interferes in the examinations, but he is always present at them.

Dr. Montgomery moved that the Visitors of the Examinations be requested to report on the question of the visitation of the examinations, and to suggest what the functions of the Visitors should be.

Mr. Evans seconded the motion, which was agreed to.

The Registrar read a report from the Pharmacy Act Amendment Committee, containing a *résumé* of the proposed amendments and the reasons for them.

Mr. Grindley said there was a rule that reports of Committees should be on the table for a month before they were discussed. This report involved vital changes, and it should not be sent forward to the Chief Secretary as representing the opinions of the entire Society without full consideration.

The President said he thought the Council would be quite in order in considering this report now. There was really nothing in these recommendations that had not received the sanction of the Council already. The report was simply a document for the information of the Chief Secretary, based on the opinions already expressed by the Council.

Professor Tichborne said they would be quite in order in considering the report now. What Mr. Grindley wanted was to have the recommendations carefully considered, and the best way of securing that would be to order the report to be printed and distributed amongst the members, and then it could be considered at the next meeting.

Mr. Hayes: Has not this matter been thoroughly threshed out already? I do not see why we should postpone it now.

The President said it was in the power of the Council to postpone the discussion of the report, but it was very important that the recommendations should be in the hands of the Chief Secretary as soon as possible. They would have to go into the hands of the Government draftsman; and it would perhaps be August before a Bill would be in shape. The English Bill was at present in the hands of the Government, and might be read any day. The Chief Secretary had said that if it were not opposed it might be taken up at once. It was very desirable that Parliament should deal with the two Bills at the same time.

Mr. Grindley said a matter which dealt with the rights and privileges of the members and licentiates of the Society ought not to be rushed forward.

The President: It has been under consideration for the last four years.

Mr. Grindley moved that the report be printed and circulated amongst the members of the Council, and that the consideration of it be taken up at the next stated meeting of the Council.

Mr. Wells seconded the motion, which was agreed to.

A report of the Committee on the supply of the Journal to the members of the Society was read.

On the motion of Mr. Hodgson, seconded by Dr. Collins, it was resolved to request the Pharmaceutical Society of Great Britain to supply the Journal to the present members of the Society for an annual payment of £20.

A report was read from the Law Committee in reference to a letter which had been referred to them from Mr. Robert J. Downes, suggesting alterations in the bye-laws of the Society. The report stated that some of the suggestions were unsuitable, and that the rest had been already dealt with.

On the motion of Mr. Hodgson, seconded by Mr. Grindley, the report was adopted.

Mr. Cornelius Mannin, 2, Great Brunswick Street, Dublin, was elected a member of the Society.

Some accounts were ordered to be paid, after which the Council adjourned.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The ninth general meeting of the thirty-fifth session was held at the Royal Institution, February 14, 1884. Mr. Edward Davies, President, in the chair.

The minutes of the previous meeting were read and confirmed and the following donations to the Library and Museum were announced:—'The Transactions of the Literary and Philosophical Society of Liverpool,' for years 1880 to 1883, from the Society.

Mr. Lorne J. M. Campbell was then unanimously elected as member.

Dr. Symes stated that Drs. Cook and Watkins, of Bay View Asylum, Baltimore, had reported in the *Medical News* that, while treating a number of malarial cases and testing the urine of the patients daily, they had been surprised to find that, on the addition of picric acid, in each case a flocculent precipitate was formed, which could readily be mistaken for albumen. The patients were taking either quinine or cinchonidine, and it was found on experiment, that sufficient of the alkaloid passed through the system unchanged to bring about the result. Dr. Symes said picric acid was a very popular test with medical men in this country, notwithstanding that greater precautions were necessary in using it, than the old test, nitric acid. For example, it had been shown by Dr. Batten (*Lancet*, Nov. 11, 1882) that any excess of albuminous urine redissolved the precipitates and also that potash salts present would cause a precipitate. His chief object in bringing the matter forward was to show that most of the difficulties connected with the use of picric acid as a test for albumen in urine could be surmounted by observing two points, viz.:—always to use an excess of the reagent, and always to apply heat. He had pointed out, on a previous occasion, the necessity for the urine being decidedly acid. Dr. Symes's remarks were accompanied by experiments demonstrating these facts.

Mr. A. C. Abraham said that the writer to whom Dr. Symes had referred had evidently paid very little attention to the details of this test as devised by the originator, Dr. Johnson, who most emphatically insisted upon the necessity of boiling after the addition of the picric acid solutions. In his (Mr. Abraham's) experience, the addition of citric acid was in some cases also necessary, when the urine was not decidedly acid, although Dr. Johnson did not recommend this, unless the sample was neutral or alkaline.

The discussion on this subject was continued by Mr. Davies and Mr. Ward, and Dr. Symes was thanked for drawing attention to it.

Mr. Richard Parkinson mentioned that on taking into use a fourteen pounds parcel of powdered African ginger, which had been some time in stock, he noticed that the paper was much stained with some substance of the nature of a resin and desired to know the cause.

Mr. Conroy, in reply, stated that African ginger contained a much greater proportion of oleoresin than the Cochin or Jamaica varieties and this had possibly caused the appearance on the wrapper alluded to, though it was more probably due to the addition of oil during grinding. African ginger was the kind usually selected for manufacture of gingerine.

The President then called on Mr. M. Conroy, F.C.S., to read some "Notes on some New American Drugs and their Nature and Properties."

The specimens shown and described were twelve in number as follows:—

Stillingia.—Root of *Stillingia sylvatica* (queen's root, queen's delight, yaw root): nat. ord. *Euphorbiaceæ*. This root possesses a peculiar, unpleasant odour, and a bitter, acrid, pungent taste. In large doses it is emetic and cathartic, in small doses alterative. It is coming into demand in this country, and is said to be a very valuable agent in the treatment of syphilitic affections. The preparation most in demandis the fluid extract.

Leptandra.—Rhizome and rootlets of *Leptandra Virginica* (Culver's root, black root, physic root): nat. ord. *Scrophulariaceæ*. The odour is feeble and not disagreeable; the taste bitter, somewhat nauseous and acrid. The freshly gathered root is said to act violently as a cathartic. In the dried state it is much milder. Used in the United States as a laxative and tonic in bilious complaints. The eclectic practitioners consider it an excellent cholagogue, and use both the impure resin, which they call "leptandrin," and the root itself as a substitute for mercurials.

Castanea.—The leaves of *Castanea vesca* (chestnut): nat. ord. *Cupuliferæ*. Used in the treatment of whooping cough, but their therapeutic value seems to be much disputed. The leaves possess a slight odour and a somewhat astringent taste.

Gossypii Radicis Cortex.—The bark of the root of *Gossypium herbaceum*, and other species of *Gossypium* (cotton plant root): nat. ord. *Malvaceæ*. Dr. Bouchelle, of Mississippi, considers it to be an excellent emmenagogue, and not inferior to ergot in promoting uterine contraction. Dr. T. J. Shaw, Tennessee, thinks it superior in the treatment of amenorrhœa to any other emmenagogue, and equal to ergot as a parturient, while attended with less danger.

Viburnum. — The bark of *Viburnum prunifolium* (black haw): nat. ord. *Caprifoliaceæ*. Taste, slightly astringent and bitter; odourless. Said to be valuable in diarrhœa and dysentery. Recommended also in nervous disorders of pregnancy, and as peculiarly efficacious in preventing miscarriage.

Euonymus.—The bark of *Euonymus atropurpureus* (Wahoo, arrow wood, etc.): nat. ord. *Celastraceæ*. Said to be useful in intermittents, dyspepsia, torpid liver, constipation and dropsy; but on the whole the character of its action is said to be uncertain.

Grindelia.—The leaves and flowering tops of *Grindelia robusta* (hardy *Grindelia*, rosin weed): nat. ord. *Compositæ*. *Grindelia* has a balsamic odour, and a pungently aromatic and bitter taste. In America it is much used in the treatment of asthma, whooping cough and bronchitis, and in the former disease it has acquired great repute.

Chimaphila.—The leaves of *Chimaphila umbellata* (pipsissewa, prince's pine, wintergreen): nat. ord. *Ericaceæ*. The taste of the leaves is pleasantly bitter, astringent and sweetish. They are diuretic, tonic and astringent, and were employed by the American Indians in various complaints, especially scrofula, rheumatism and nephritic affections. It is now used in the treatment of dropsy.

Cimicifuga.—The rhizome and rootlets of *Cimicifuga racemosa* (black snake root, black cohosh): nat. ord. *Ranunculaceæ*. Said to be very useful in rheumatism, also in lumbago, sciatica, etc. Better known in England as *Actæa racemosa*.

Cypripedium.—The rhizome and rootlets of *Cypripedium parviflorum* (ladies' slipper, moccasin root); nat. ord. *Orchidaceæ*. The odour is heavy and unpleasant, and the taste sweetish, pungent and bitter. Used as a gentle nervous stimulant or antispasmodic. It has been used for the same purposes as valerian, but is said to be less powerful. Said to be useful in epilepsy.

Rhamnus Purshiana (*Cascara sagrada*), nat. ord. *Rhamnaceæ*.—The demand for this bark and its preparations has lately been considerable in this country. It is said to possess tonic laxative properties. Cathartic in large doses; stomachic and tonic in small.

Xanthoxylum.—The barks of *Xanthoxylum fraxineum* and *Xanthoxylum Carolinianum* are official in the U. S. Pharmacopœia under this title. Nearly inodorous, bitter, and very pungent.

Xanthoxylum is stimulant, producing when swallowed a sense of heat in the stomach with more or less arterial

excitement. It is said to resemble mezereon and guaiacum in its remedial action. As a remedy in chronic rheumatism it enjoys considerable reputation in America. The bark used as a masticatory is a popular remedy for toothache.

Mr. Conroy described the nature and properties of each specimen and its medical and therapeutical uses, and in conclusion said that the specimens were collected by Messrs. Evans, Sons and Co., who requested him to offer them to the Association as a gift to its museum.

Mr. R. Parkinson said he had much pleasure in moving a vote of thanks to Mr. Conroy for his interesting paper, and also to Messrs. Evans for the gift of the specimens.

Mr. A. C. Abraham seconded the motion, and made some remarks on one or two of the specimens.

The discussion was continued by Dr. Symes, Messrs. J. S. Ward, A. H. Samuel and Davies, and the motion on being put was carried unanimously. Mr. Conroy having briefly replied, the meeting terminated.

ABERDEEN CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

At the weekly meeting of this Association, held on Friday, the 7th inst., in the Café, Aberdeen, the President, in the name of the Association, presented Mr. G. D. Bowie, Secretary of the Association, who is leaving to fill a situation in Stonehaven, with an address expressing appreciation of the services rendered to the Association in his capacity of Secretary, and also of his general character and ability.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The ninth meeting of the present session was held in the Pharmaceutical Society's rooms, 119A, George Street, on Thursday evening, February 28, at 9.15, Mr. C. F. Henry in the chair.

The minutes of the former meeting were read and confirmed, after which Mr. Peter Boa read a paper on "The Cultivation of Taste in the Practice of Pharmacy." In introducing the subject the essayist showed that the pharmacist is generally looked upon by the public as a man of taste. This he held to be due primarily to the fact that pharmacies as a rule are neatly furnished and have a air of refinement. But, although the environments of the pharmacist may show good taste, it is quite possible that this may be due to the skill of the cabinet maker, by whose judgment he has been guided. The true indication of good taste on the part of the pharmacist is found in the manner in which he finishes his work; he may be scientifically accurate in his manipulations, but if he send out slovenly done-up parcels, written directions, etc., he puts before his customer causes for reflection and mistrust. In fact, a patient cannot judge of the contents of a bottle; but if it be delivered to him in a condition which shows that care and good taste have been exercised in finishing it off, he judges that equal care has been exercised in the professional part of the transaction. The essayist, therefore, held that in pharmacy, cultivation of taste should begin with pupilage, and if the pupil be trained to perform well those parts of his work upon which the public sums its judgment, he is brought into a groove which leads him to exercise accuracy and good taste in the purely pharmaceutical part. The essayist then expressed his thoughts on the selection and use of corks, labels, paper, twine, sealing wax and address stamps, and placed on the table several examples of gross violation of good taste on the part of pharmacists, in that department.

The essay was well received by a large audience, and on the motion of the President, seconded by Mr. MacEwan, a hearty vote of thanks was awarded to Mr. Boa.

A long and animated discussion followed, in which Messrs. Crowden, Duncan, Hill, Robertson, Simpson, Turnbull, and others took part, Owing to the lateness of the hour, the other business was delayed until the next meeting, which was held on Wednesday, March 5.

At this meeting, Mr. Boa presided, and after the minutes of the former meeting had been read and confirmed, Mr. J. B. Dunlop read a paper on "Pharmacopœial Natural History," in the course of which he gave a very interesting account of the various animal substances of materia medica, a special feature of the paper being a series of artistic drawings executed by Mr. Jardine, an apprentice member of the Association. The paper was further illustrated by typical specimens of the drugs treated of. A vote of thanks was awarded to Mr. Dunlop, and a discussion followed in which several members took part.

Mr. A. H. Simpson then introduced a proposed resolution that the papers read before the Association should be printed at the end of each session, and moved that the Committee of the Association should be instructed to consider the matter in its details, and report. The motion was seconded by Mr. Hill and agreed to.

After several queries had been replied to, notice of others was given for next meeting, which will be held on March 26, when Mr. W. S. Turnbull will read a paper on "Elementary Botany," intended for the guidance of those preparing for examinations.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on March 6. Dr. W. H. Perkin, F.R.S., President, in the chair.

It was announced that a ballot for the election of Fellows would take place at the next meeting of the Society (March 20).

The following certificates were read for the first time:—Messrs. G. C. Bose, J. P. Battershall, W. D. Crumbie, W. J. Grey, H. G. Greenish, J. H. Wainwright.

Dr. Miller then read a paper, entitled—

Studies on Sulphonic Acids. No. I. *On the Hydrolysis of Sulphonic Acids, and on the Recovery of Benzenes from their Sulphonic Acids.* By H. E. Armstrong and A. K. Miller. The authors were led investigate the behaviour of sulphonic acids on distillation with sulphuric acid, in the course of a study of the hydrocarbons resulting from the action of dehydrating agents upon camphor, their primary object being the separation of the 1:2:3:5 tetramethylbenzene. It appeared, from various considerations, probable that this body would form a highly unstable sulphonic acid. It was found on passing steam into the sulphuric acid solution of the mixtures of hydrocarbons from camphor that all the benzenes could in this way be recovered. The method consists in passing steam through the solution of sulphonic acid or sulphonate in sulphuric acid, the acid solution being heated and mainmained at the temperature at which hydrolysis takes place with fair rapidity. A weight of acid was usually employed equal to that of the sulphonate taken. Apparently no decomposition of any of the benzenes takes place, and the yield of hydrocarbon may be said to be theoretical. The authors give the following list of sulphonic acids used, and the temperature of initial hydrolysis:—Benzensulphonic acid, 175°; toluenparasulphonic acid, 150°; metaxylensulphonic acid, 120°; orthoxylensulphonic acid, 120°; paraxylensulphonic acid, 120°; pseudocumene sulphonic acid, 115°; mesitylensulphonic acid, 100°; cymensulphonic, 130°; 1:2:3:5 tetramethylbenzensulphonic acid, 120°; metamethylisopropylbenzensulphonic acid, 120°; 1:2:4 dimethylethylbenzensulphonic acid, 120°. From their results the authors believe that it will be possible to separate many hydro-

carbons by this "fractional hydrolysis" from mixtures of their sulphonic acids. The authors give some results in which the rate of hydrolysis at different temperatures has been studied. They are about to investigate the influence of pressure on the rate of hydrolysis.

Dr. Tilden asked if there appeared to be any relation between the composition of the sulphonic acids and the temperatures at which they were decomposed,

Dr. Armstrong said that sufficient data had not yet been obtained, but apparently the simpler the constitution the less readily did decomposition take place. He also mentioned that in many cases fractional distillation completely failed as a method for purifying hydrocarbons, principally because bodies belonging to different series, but having the same boiling point, were often present in the same mixture. By the above method this difficulty might be overcome. The excess of hot strong sulphuric acid was also advantageous in carbonizing some hydrocarbons present as impurities.

The Secretary then read a paper—

On a Relation between the Critical Temperatures of Bodies and their Thermal Expansions as Liquids. By T. E. THORPE and A. W. RÜCKER.—From Van der Waals' investigations it appears that the want of similarity between the formulæ which express the expansions of liquids is due to the fact that their initial point is, in general, the arbitrarily-selected temperature of melting ice; uniformity of mathematical expression can only be attained, if, in each case, the temperature is expressed, not in ordinary thermometric degrees, but as a fraction of the absolute boiling point of the substance. It is thus possible to obtain the law of the thermal expansion of any one liquid from that of any other, if their critical temperatures be known. Mendelejeff, in a paper recently read before the Chemical Society, gave an extremely simple and accurate empirical formula for the expansion of liquids. One of the conclusions at which Van der Waals arrives is that the product of the coefficient of expansion under constant pressure into the absolute critical temperature is, at corresponding temperatures, the same for all bodies. By combining these two formulæ the authors arrive at a formula, which may be expressed in words as follows:—The density of a liquid is proportional to the number obtained by subtracting its absolute temperature from its absolute critical temperature, multiplied by a constant which is the same for all substances. The values of this constant in the case of the substances for which the necessary experimental data exist are almost identical, and approach very closely; therefore the above expression can be further simplified thus: The density of a liquid is very nearly proportional to the number obtained by subtracting its absolute temperature from twice its absolute critical temperature. If further investigation proves that the range of variations in the above constant is small, the expression already given affords a ready and valuable means of calculating the critical temperatures of bodies from observations on their expansions as liquids.

Dr. Hugo Müller then took the chair, while Dr. PERKIN read a communication entitled—

Remarks on the Densities of Members of Homologous Series.—An investigation, in which the author has been for some time engaged, necessitated the determination of the densities of an extended series of carefully prepared products, especially the acids and ethers of the fatty series. On examining these results they exhibited a relationship to each other; the results were therefore plotted in curves, in which the numbers of carbon atoms were used as abscissæ, and a scale of numbers, embracing those of the densities, as ordinates. The curves so obtained are regular, and the dots representing the experimental numbers are either on or close to the curves, and it is obvious, from an inspection of the curves, that the densities of the homologous acids and ethers follow a regular law.

Dr. Tilden remarked that there were singular irregularities as regards the physical properties, for instance melting points, in some of the homologous series.

Dr. Armstrong suggested that in the case of formic and acetic acids this might be explained by supposing that the influence of the hydrocarbon portion of the acid was small compared to that of the oxatylic portion; and again we had no evidence to prove that the formula of acetic acid was not more complicated than $\left\{\begin{matrix}CH_3\\COOH\end{matrix}\right.$. If a formula could be calculated for Dr. Perkin's curves it might be most valuable in discriminating isomeric acids.

Dr. Perkin said that as regards magnetic rotation formic and acetic acids seemed to be outside the fatty acid series, which seemed to commence with propionic acid.

Mr. FARRINGTON then read a—

Note on some Experiments made at the Munster Agricultural School to determine the value of Ensilage as a Milk and Butter-producing Food.—Two cows were fed for a week upon ensilage and five lbs. of meal, and for a second week upon a mixed food of carrots, beet, hay and oats. The total quantity of milk obtained with the ensilage was 433½ lbs., giving 1 lb. of butter from 33 of milk; with the ordinary food 414½ lbs. of milk yielding 1 lb. of butter to 34·5 from milk were obtained. The butter from the ensilage was inferior in quality. The author states that 84 lbs. of ensilage replaced 25 lbs. of hay, and that the expense of making hay and its equivalent of ensilage was equal, but that the use of ensilage effected a saving for each cow daily of two stone of roots and ¼ bushel of grains. The total solids and cream in the milk were estimated. In answer to some questions of Mr. Warington the author stated that he was unable to give the basis upon which the equivalent quantities of hay and ensilage were calculated, and did not know whether the grass was compounded of the same materials (grass, vetches, etc.) as the ensilage.

The Secretary then read a—

Note on the Behaviour (I.) *of the Nitrogen of Coal during Destructive Distillation*; *and* (II.) *a Comparison of the Amounts of Nitrogen left in Cokes of various Origin.* By WATSON SMITH. — Professor Foster, in a recent paper (*Chem. Soc. Jour. Trans.*, 1883, 110), states "I have not made any experiments on the amount of nitrogen in tar, nor am I in possession of any information on the subject. I have assumed that the quantity is relatively small." The author of the present paper has investigated the subject, having observed in 1868 that ammonia was frequently formed during the distillation of coal tar. He has obtained the following numbers: nitrogen in the tar 1·667 per cent.; in crude benzene from the tar 2·327; in "light oil" 2·186; in creasote oil 2·005; in "red oil" 2·194; in the pitch 1·595. The author has also estimated the amounts of nitrogen in three cokes, *a.* ordinary gas coke, *b.* Beehive metallurgical coke, *c.* a hard compact metallurgical coke from Simon Carve's oven. *a.* contained 1·375 per cent; *b.* 0·511; *c.* 0·384 per cent. of nftrogen.

Mr. E. W. Voelcker said, in some experiments which he had recently made, he had found that it was impossible to get rid of the whole of the nitrogen by carbonizing such bodies as peat, charcoal, etc., even when very high temperatures were used. These results seemed to have an important bearing on the analysis of nitrogenous bodies by the soda lime method; when manures from such substances as blood, fish guano, etc. were analysed, if any lumps formed the whole of the nitrogen could not be obtained.

Mr. Groves said that no statement was made as to where the coke came from, whether from the middle or sides of the oven. The middle portion of the coke being subjected to a much lower temperatures than the coke at the sides might be expected to contain more nitrogen.

On a Hitherto Unnoticed Constituent of Tobacco. By

T. J. Savery.—Whilst examining some tobacco for sugar, a substance was noticed in the aqueous solution which reduced Fehling's solution. This body was almost completely removed by clarification with subacetate of lead and the resulting liquid was free from sugar. The author succeeded in isolating this reducing substance by precipitation with subacetate of lead, decomposition with sulphuretted hydrogen, etc. The substance gave a green coloration with ferric chloride, changing to red on the addition of potash; with ferrous sulphate alone no change was produced, but when this reagent was added with ammonia, a dark brown colour appeared. A purer product from unmanufactured tobacco gave the same reactions and developed a red colour with strong sulphuric acid, changing to a claret on the addition of a trace of nitric acid. A green colour was produced with either potash or ammonia. The substance precipitated hydrochlorides of quinine and cinchonine. The author concludes that the body is closely allied to caffetannic acid and names it tabacotannic acid. No analyses are given.

The Society then adjourned to March 20, when a ballot for the election of Fellows will be held, and a "Note on the Preparation of Marsh Gas," by Dr. Gladstone and Mr. Tribe will be read.

Parliamentary and Law Proceedings.

The Dispening of Large Doses of Ergot.

An adjourned inquest, touching the death of a woman named Sarah Ballinger, was held on Monday last at Cheltenham, before Mr. Coren. The woman was living apart from her husband, and the proceedings at the inquest with respect to the dispensing of certain prescriptions may present points of interest to our readers.

Mr. Boughton, the medical practitioner who attended the deceased, being recalled, stated that he thought the deceased was suffering from a kind of fibroid tumour, which had been growing, he thought, for about three months. Such a tumour would not always leave traces when it came away. The reason he saw deceased three or four times a day during the last fortnight was because she was so much worse. She was very intermittent in her illness, and during the last week he thought the case was a very serious one. He thought about a week before her death that she would not recover. The applications he used were carbolic acid and Condy's fluid, and Dr. Kirkland used the latter. A fibroid tumour could be removed without an operation.

Mr. Hands, chemist, here, at the request of the Coroner, produced some prescriptions, and Mr. Boughton admitted the initials to them. The Coroner showed the witness one document, and asked if it was in his handwriting. Without examining it, Mr. Boughton said it was.

Mr. Boughton was then questioned as to the nature of the prescriptions.

The Coroner then pointed to a prescription, and asked the witness whether it could not be used for an unlawful purpose.

Witness: It could not, and certainly not in the dose there. It it a small dose.

Mr. Coren then asked the witness if he knew the Mrs. Roberts to whom the prescription was given?

Witness: No, I am sure I do not.

The Coroner: Do you know anyone named Roberts living at Bristol Road, Gloucester?

Witness: No.

The Coroner: You keep no books, and, therefore, cannot tell anything about it?

Witness: No, sir, I cannot. The doses were moderate.

Having cautioned the witness, Mr. Coren asked: Was that prescription not given for an unlawful purpose?

Witness: No, sir, decidedly not.

The Coroner: Would it have that effect?

Witness: No, sir, I do not think it would in that dose.

The Coroner: I think it is due to the chemist to say that he did not dispense that prescription, but gave something of a different character.

Mr. Heath: May I ask who that was?

The Coroner: Mr. Hunt, of Gloucester. I think it is only right I should state this, and I have a copy of the prescription made up by Mr. Hunt in lieu of that given by Mr. Boughton. Here are the two documents, and I merely make the explanation.

The witness's examination was then resumed. In reply to questions he said his practice was mostly amongst women and children. The prescription to Mrs. Roberts was given for a purely lawful purpose, and was not in excess of the dose permitted by the Pharmacopœia.

By Mr. Heath: It was quite possible that he should have given the prescription read to a Mrs. Roberts, whom he might have known nothing about. He had no remembrance of the woman calling herself Roberts for whom he wrote that prescription, and as a matter of practice he often gave prescriptions to persons whom he did not know before. He had had special practice in these cases, and might therefore give stronger prescriptions in this particular class of disease than other men might do; and this Mrs. Roberts might have been suffering from a tumour such as the deceased was suffering from. When deceased first came to him he was in some little doubt as to the exact nature of the complaint from which she was suffering. It took him a fortnight to discover what the exact tumour was, though he had the opinion all along that a formation would have to be removed. If the deceased had been pregnant when he first examined her, there would not have been the symptoms of which he had previously spoken. Dr. Kirkland was called in at the request of the relatives, who gave him the money to pay the fee. When the first prescription was made up he told the woman of the house to ask the dispenser to moderate the ingredients. He was attending another patient at the time at 2, Granville Street, and they both had a dose of the same medicine. In all the prescriptions he had followed the Pharmacopœia in such cases.

Mr. Clark: These prescriptions you gave seem to have been made up by no less than three separate chemists—Mr. Hands, Mr. Board, and Mr. Spiers—within a month.—Yes, they were.

Did you direct them to be taken to those various places?—I did.

For what reason?—I had no particular reason at all.

Is it usual for a medical man to write out his prescription, and in the space of one month to send to three different chemists?—Yes, if he likes.

In your particular line?—Yes.

In reply to a Juryman, witness said the dose given to Mrs. Ballinger was one-third less than that given in Mrs. Roberts's prescription.

Mr. William Hands, chemist, High Street, produced prescriptions dated the 31st of January and the 22nd of February. The first prescription was brought when he was out, but he dispensed it, altering it a little. He thought the dose of ergota too large, and he put half an ounce instead of two ounces as mentioned in the certificate.

The Coroner: Then in point of fact you put a fourth of the dose.

Witness replied that was so. He thought that Mr. Boughton had made a mistake, and he explained it to him afterwards. That was the only alteration he made. One was a simple tonic mixture, and was dispensed according to the prescription. He should like to remark that he had received dangerous prescriptions from other medical men in the town. For instance, he was once ordered to put 16 grains of strychnine in sixteen pills, and he had to consult the doctor before he did it.

The Coroner said there was no doubt medical men

were liable to mistakes, as in the recent death at the Infirmary at Gloucester, where the patient died from an overdose.

The Coroner then asked the witness to examine the other prescriptions put in which were dispensed by other chemists. After examiuing them he said that he should not have dispensed one of them (the prescription given to Mrs. Roberts) without first asking Mr. Boughton.

The Coroner: Would you give me your opiuion of that prescription?

Mr. Hands: I would rather not. There are medical men here, who would speak better than I can.

The Coroner: Of course I should not like to press you.

Mr. Hands: I do not know the nature of the case prescribed for.

The Coroner: I can ask you this, Would you dispense it?

Mr. Hands: No, sir. Not without consulting the medical man who wrote it.

A juryman (Mr. Gallop) asked the witness if the reason why he did not dispense the dose as originally prescribed was because it was a dangerous one.

Mr. Hands replied that he would rather not answer. It was a question for the medical men.

Another juryman (Mr. Smith): May we take it that as the witness refused to dispense in that quantity he considered it dangerous?

Mr. Hands: Well, it is not a usual dose.

Mr. Thomas Francis Board, chemist, High Street, identified two bottles containing medicines found in the bed room in which the deceased died as having been dispensed at his shop. He said he held no prescriptions from Mr. Boughton, but he remembered giving the larger bottle of mixture, and the small bottle of mixture produced, to Mr. Boughton. He made up the contents of the large bottle from verbal directions given to him by Mr. Boughton. It contained 40 grains of quinine, with a little acid to dissolve it. This made a powerful tonic, but there was nothing dangerous in it. The small bottle was also made up at the request of Mr. Boughton, and someone called afterwards for it. It contained a drachm of a preparation of opium, and was a usual dose.

Francis John Spiers, in reply to the Coroner, said he was not a chemist or a dispenser. He kept a chemist's shop in the High Street, which belonged to his father, who was a qualified dispenser. He had not passed any examination as dispenser, but he was reading for it. He served an apprenticeship with Mr. Gibbon, and was dispenser at the Dispensary. His father was responsible for the shop. He dispensed two of the prescriptions. (These were stated by the Coroner to be of an ordinary character.)

Mr. Edward Pearce Spiers, chemist, High Street, said that he dispensed prescription No. 1, but not as written. He was desired by the person who came for it to modify the dose. The prescription was for two ounces of liquid extract of ergota, and though he gave half the quantity, that which he gave was of the same strength as required by the prescription.

Dr. Kirkland, recalled, stated that he saw the deceased on the Sunday morning before her death. She was semi-conscious. He asked the deceased if she had had a premature birth recently, and she said "No; four or five months ago." He believed the deceased was suffering from blood poisoning of an acute character. If the deceased had had what she said she had three or four months previously he should, under certain circumstances, have anticipated that the same symptoms would have been observed. That, in fact, was his diagnosis of the case, formed from the history given of it by Mr. Boughton. The latter said that he thought he had removed a tumour from the deceased, who was feverish afterwards, and he could not quite understand it. The fact that a tumour had been removed would not necessarily be observable in a *post-mortem* examination. A tumour would be treated by drugs, and ergota would probably be used. He attended the deceased on behalf of Mr. Arkell, a relative of the deceased. Having looked at the prescriptions, witness said that prescription No. 1 was a pharmaceutical dose, and so was No. 4, and there was nothing special about the other prescriptions given in the case. Ergota would be quite properly given for a fibroid tumour. Three of the ingredients in No. 6 (Mrs. Roberts's) were rather large doses, larger than he should give.

The witness was examined at great length on the medical aspect of the case. He stated in reply to the Coroner that the same means and the same medicines used in this case, to remove a supposed tumour, might have been effectual for another purpose. From the symptoms he thought himself that a premature birth had taken place, and it might have been recently, or three months ago.

At this stage the inquiry was adjourned.—*From the Cheltenham Examiner.*

Poisoning by "Naphthine."

The *Northern Whig* of Wednesday reports an inquest held in Belfast touching the death of Mrs. Mary Ann Thomson, the wife of Deputy Surgeon-General Thomson. According to the evidence Mrs. Thomson had conceived an unwarranted jealousy respecting her husband, which caused her to behave strangely, and on the previous Friday he came to the conclusion that she had taken poison. Medical assistance was obtained, but considerable difficulty was experienced in procuring a stomach pump that was in order. An emetic of mustard and water was in the meantime administered, but all the efforts to save the lady's life were futile, and Mrs. Thomson died about eleven o'clock. The *Northern Whig* goes on to say that it was ascertained at the inquest that deceased had partaken of chloral, and it further appeared that in the early part of last week she drove in a cab to the establishment of Messrs. Grattan and Co., Corn Market, and there purchased a quantity of naphthine (*sic*), the value which, together with a small hypodermic instrument for the purpose of injection, was £2. She produced a copy of a medical work, and said she wanted two bottles of the naphthine for a friend in India, and that it would require to be carefully packed in a box so that it might be conveyed to its destination in safety. It seems that the assistant in the shop, after some consultation with the manager, supplied the lady with the naphthine, without obtaining from her any signature, and that she thereupon drove off. On the night after Mrs. Thomson died, her husband and Dr. Arnold, on searching the bedroom, discovered in her wardrobe one of the two bottles in which she had received the naphthine, and subsequently found the box in which the bottles had been packed.

A good deal of discussion took place at the inquest as to the propriety of supplying such a large quantity of poisonous liquid to a stranger, and the Coroner considered it advisable to send for Mr. Yoxall, the manager of Messrs. Grattan's establishment in Corn Market. This gentleman, on his arrival, pointed out that the Act of Parliament did not require the seller to obtain signatures for this particular fluid.

The Coroner objected in very strong terms to such a large quantity of it being given to any person who was unknown to them, and said that, although the establishment of Messrs. Grattan, as they all admitted, was one of the finest and best conducted of the kind in the three kingdoms, yet they must be careful not to allow a repetition of such an occurrence.

After considerable discussion regarding the various features of the case, the Jury returned a verdict to the effect that Mrs. Thomson had committed suicide by partaking of poisonous fluids whilst in a state of unsound mind.

FATAL DISPENSING MISTAKE.—COMMITTAL OF AN ASSISTANT FOR MANSLAUGHTER.

An inquest was opened on Tuesday, the 4th inst., at Bristol, before Mr. H. S. Wasbrough, city coroner, into the circumstances attending the death of Eliza Vowles, a married woman, thirty-three years of age, whose death was alleged to have been caused by an ipecacuanha powder being made up for her by a chemist's assistant, instead of jalap powder. Several witnesses were examined, and the inquest was adjourned till Thursday, for a *post-mortem* examination to be made.

At the adjourned inquest on Thursday,

Mr. L. M. Griffiths said he had made a *post-mortem* examination of the body. He examined all the cavities of the body. There was considerable evidence in the chest of disease, some of which was of long standing. There was also evidence of serious disease of the bronchial tubes. There was considerable adhesions of the membrane covering the lungs, and of the lungs themselves. There was evidence in the upper part of the lungs of consumptive disease, but it was not active. The other organs were much congested, but otherwise healthy. He considered the congestion to be due to the opium. There was scarcely anything in the stomach. He attributed death to an overdose of opium, which acted with unusual force upon the deceased, who was a person in exceedingly weak health. Deceased was naturally a weak person and had been brought lower by the disease in the chest. The immediate cause of death was opium poisoning.

Mr. Keevill, chemist, said his assistant was a very careful man, and he had had considerable experience. At the time when Mr. Vowles came for the powders he (Mr. Keevill) was out of the shop; but he had since gone into the matter, and found that his assistant was going to make some compound ipecacuanha pills that same evening. When Mr. Vowles came for the powders he referred to the books, and found the prescription. Directly underneath Mrs. Vowles's prescription was one for ipecacuanha powders; it was of the same amount, and the price was also the same, and that was how his assistant came to make the mistake. Mr. Keevill produced the book in which the prescriptions were entered.

The Coroner, in summing up the case, said the question the jury would have to decide lay in a small compass. The chief point was whether due care was used by the assistant in dispensing the medicine. If they thought sufficient care was not used, then the assistant was guilty of culpable negligence. The deceased had suffered from consumption, for which jalap powders were prescribed. These did her good, and on Monday the husband went to the chemist for some of them, and instead of giving him compound jalap powders the assistant gave him compound ipecacuanha powders, which contained opium. One of these powders, when administered to the deceased, brought on drowsiness, and eventually the woman died from the effects of taking it. The deceased, having been suffering from consumption, was naturally weak; but it made no difference, however weak she might have been. If, through the carelessness of anyone, her life was shortened, then it was criminal negligence. He advised them to dismiss the case of consumption, for if the woman could not have lived long, yet through the carelessness of someone she died, then it amounted to the same thing; the law was quite clear upon that point. He quoted a case to explain the point, in which a woman sent to a chemist for a pennyworth of paregoric for a sick child. The message was properly delivered, but by the side of the bottle containing the paregoric was one containing laudanum. The apprentice, in mistake, took down the bottle of laudanum and gave it for the paregoric. It was taken home and some given to the child, who died from the effects of it. The apprentice in this case was committed for manslaughter. He thought that case and the present one were very similar. If they thought that when the jalap powders were sent for and ipecacuaha powders sent back, the assistant exercised due and ordinary care, he would be free from blame; if not, he was guilty of criminal negligence. It was most important to the public that all prescriptions should be dispensed accurately, because their lives were in the hands of dispensers.

After a short consultation the jury returned a verdict of "Gross negligence on the part of the assistant."

The Coroner: You know that amounts to manslaughter?

The Forman: Yes.

The assistant, who is a German, named Thomas Klomowski, was therefore committed for trial on a charge of manslaughter.

The case also came before the magistrates at the Police Court on a charge of manslaughter against Thomas Klomowski. After hearing the evidence, the chairman of the magistrates said they had carefully considered this case, and there was no doubt the defendant made a mistake in taking the prescription, which was not the one he should have taken. Death was accelerated by the medicine, but the bench could not see that there was any gross carelessness in the case. If this had been done with an utter absence of care they would consider it culpable, but care was taken, and this was an error. They did not think it was a case of manslaughter. The charge would be dismissed.

Obituary.

Notice has been received of the death of the following:—

On the 29th of January, Mr. Thomas Mills Nall, Pharmaceutical Chemist, Stanley Street, Leek, Staffordshire, Aged 63 years.

On the 8th of February, Mr. James Moore Crosby, Chemist and Druggist, Newborough Street, Scarborough. Aged 56 years.

On the 13th of February, Mr. Edwin Green, Chemist and Druggist, High Street, Market Harborough. Aged 35 years.

On the 18th of February, Mr. Henry Woolhouse Shaw, Pharmaceutical Chemist, Market Place, Doncaster. Aged 42 years. Mr. Shaw had been a Member of the Pharmaceutical Society since 1871.

On the 18th of February, Mr. Humphrey Wolferstan, Chemist and Druggist, Kirk White Street, Nottingham. Aged 68 years.

On the 22nd of February, Mr. William Francis Williams, Pharmaceutical Chemist, Beaufort Square, Chepstow. Aged 35 years.

Correspondence.

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COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Beckett, Williams, Bennett, Granville, Inquirens, Associate.

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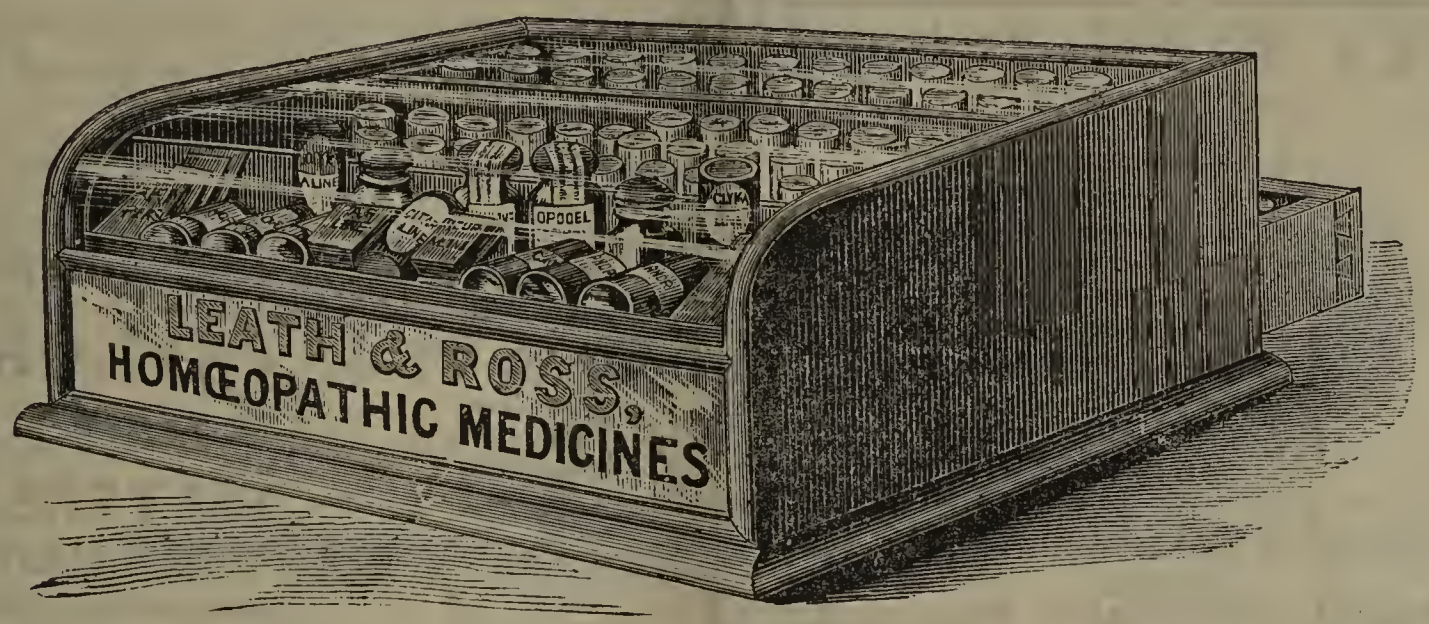

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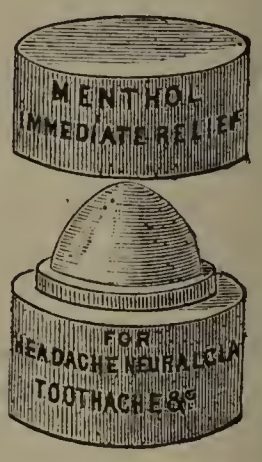

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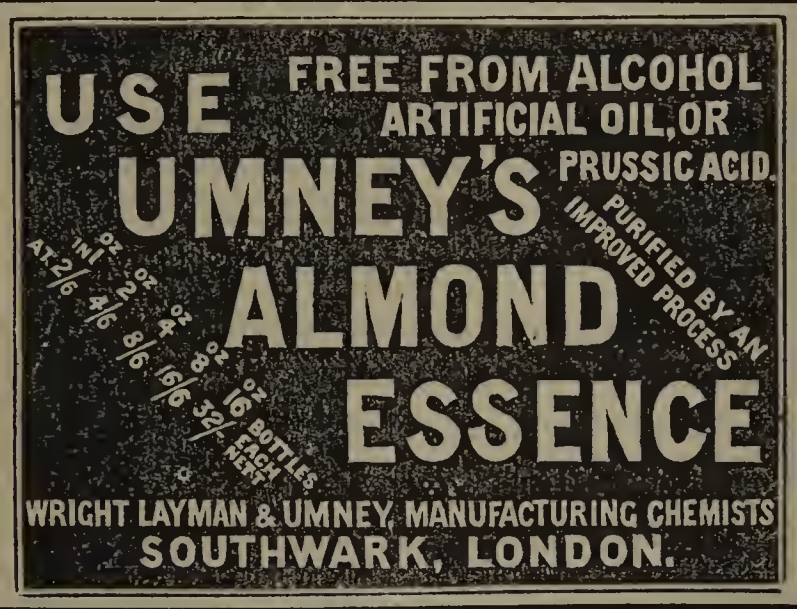

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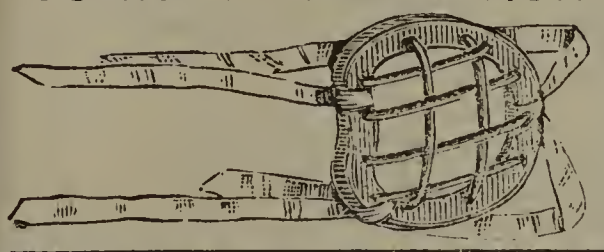

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AS JUNIOR, in a good Dispensing business, in London. Height 5ft. 9in. Age 21. 4 years' experience. DRUG, care of Clively, 430, Essex Rd., N.

ENGAGEMENTS WANTED.

AS JUNIOR. Town or country. 7½ years' experience. Age 23. Height 5ft. 6in. Good references. Disengaged. CHEMICUS, Rock Ville, Manordilo, Carmarthenshire.

TEMPORARY. Ætat. 31. Town or country. By day or week. Thoroughly experienced in all branches. Irreproachable references. Terms moderate. Disengaged. A. WOOD, 7, Woodfield Cres., Harrow Rd.

AS JUNIOR, in a good Dispensing business, in London. Height 5ft. 9in. Age 21. 4 years' experience. MEDICUS, 67, Queen's Rd., Bayswater, W.

MANAGER, or for Branch. Age 33. Single. Qualified. Accustomed to town, country, and agricultural trade. Suburbs or provinces preferred. Disengaged. ASSOCIATE, 78, Wells St., Oxford St., London, W.

AS ASSISTANT, in a good business. Age 22. Height 5ft. 8½in. 7 years' experience. Good references. Disengaged April 3rd. C. W. R., 12, The Foregate, Worcester.

WHOLESALE.—By advertiser, in Wholesale Drug or Drysaltery Warehouse. Age 25. Good references. WHOLESALE, 4, Ben St., Radford, Nottingham.

AS JUNIOR, in first-class Dispensing business, with time for study. London or watering place. Age 21. Good Dispensing experience. Disengaged beginning of April. E., Winnock Lodge, Colchester.

AS ASSISTANT or MANAGER, in London. Age 28. Qualified, single, good references. W. C. F., 6, Salisbury Ter., Dawes Rd., Fulham.

AS MANAGER or SENIOR. London or South of England preferred. Age 29. Qualified. Over 3 years in last situation. Good references. Temporary not objected to. Salary, &c., to J. T. LIVESEY, Station Rd., Kirkham, Lancashire.

AS Aerated Water BOTTLER or Chemist's PORTER. Knowledge of pill making and coating. Permanency required. Married. Good reference. ARTHUR TOPLISS, Wells St., Sandbach, Cheshire.

AS JUNIOR, or DISPENSER, in a good house in London. Excellent references. MAURICE HYWEL JONES, 1, Newton St., Holborn.

AS JUNIOR, at once. Seaside preferred. Height 5ft. 9in. 3 years' experience. Good reference. C. A., Mr. J. P. ALCOCK, Chemist, Evesham, Worcs.

AS JUNIOR. In-door. Age 22. 4½ years' experience. Good reference. R. W., 6, Bristol Gardens, Maida Hill, W.

IN London, for a few hours daily, by Minor, as DISPENSER to Medical Man; or by Chemist. Good testimonials and experience. ALPHA, 55, Grosvenor St., W.

AS JUNIOR. London. Time for study preferred. Disengaged. 3 years' experience in first-class Retail and Dispensing. Height 5ft. 10in. Age 21. Passed Prelim. BETA, 71, Euston St., N.W.

RE-ENGAGEMENT as MANAGER. Married, no family. 20 years' London and provincial experience. Competent Dispenser and Prescriber. Qualified by exam. Permanency. A. P. S., 6, Leslie Rd., Dorking, Surrey.

AS ASSISTANT. Apothecaries' Hall qualification. Height 5ft. 8in. 6 years' experience. J. W., 230, Market Sq., Dudley.

AS MANAGER (temporary or permanent), in town or country. Experienced in Prescribing and Dentistry. Married. Disengaged about the 20th. K. D., 1, Marion Villas, Strode Rd., Forest Gate.

AS ASSISTANT. London. Two evenings a week for study. Good Dispensing and Retail experience. Age 22½. Salary £36. Hall qualification. H. S., Bar House, Falmouth, Cornwall.

ENGAGEMENTS WANTED.

AS MANAGER or SENIOR. Out-door. Qualified. Town and country experience, and first-class references. CHEMICUS, 15, Durning Rd., Edge Hill, Liverpool.

BY a competent married ASSISTANT, a permanency, town or country. 6½ years' reference from a first-class firm. W. A., 18 Marston St., Oxford.

WHOLESALE. Either Wet or Dry Counter. Or as Under WAREHOUSEMAN. 9 years' experience Wholesale, 5 Retail. Liverpool and London houses. CHEMICUS, 41, Oxford Rd., New North Rd., N.

IMMEDIATELY.—As ASSISTANT. Out-door preferred. Minor qualification. Good Prescriber and Dispenser. Can Extract Teeth. Good references. Age 27. X., 26, Clapham Rd., S.W.

AS JUNIOR, in a good Dispensing business, where a knowledge of Dispensing may be obtained, with time for study. Salary of no object. Age 22. Height 5ft. 10in. F. JOHNSON, High St., Tadcaster.

AS JUNIOR, by April 4th. London or South of England. In light Retail and Dispensing business. Age 20. Height 5ft. 7in. F. ORANGE, Market Pl., Stowmarket.

ASSISTANTS WANTED.

A COMPETENT in-door ASSISTANT, not under 24. An accurate Dispenser and good Counterman, who is well acquainted with first-class Retail. Also a JUNIOR. Short hours. Two kept. State age, height, references, experience, and salary required, with carte (to be returned). C. L. METCALFE, Pharmacist, 13, Whitefriargate, Hull.

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ALEXANDER FORREST, Secretary.

CHILDREN'S Hospital, Birmingham.—A DISPENSER is required for the above Institution. His duties will involve daily attendance from 9 till 6 o'clock, and the salary will be £80 per annum. Information as to the duties may be obtained on application to the Secretary, Steelhouse Lane. Candidates, who must produce evidence of their having passed at least the Minor examination of the Pharmaceutical Society, must send in their application and testimonials to the Secretary not later than Tuesday, April 1st. JOHN HENRY LLOYD, Hon. Sec.

Board Room, Steelhouse Lane, March 11, 1884.

AN ASSISTANT, of good address, accustomed to a first-class Dispensing and Family business. One seeking a permanency preferred. Apply, stating age, height, salary required (in-doors), references and carte, S. HUGGETT, Fairfield Pharmacy, Liverpool.

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AN ASSISTANT, with Minor qualification, for a good class Dispensing business, where one assistant only is employed. Salary £45 to £50. Personal application, or full particulars, with carte, to H. C. BIRCH, Upper Norwood, S.E.

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ASSISTANT. At once. In-door, £50. To take Management of brisk Retail and Prescribing business. Apply, J. P., 44, Camberwell Rd., S.E.

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AN ASSISTANT, about 21 or 22 years of age, accustomed to a good-class country business. Apply, stating full particulars of experience, age, height, and salary required, to H. ALTHORP, Chemist, Peterboro'.

AN ASSISTANT, in-doors, at end of month, about 21 or 22, accustomed to a Dispensing business. Apply, stating age, height, references, salary required, and enclosing carte, to E. TEBBUTT, Chemist, Kilburn, N.W. Applications not replied to in four days to be considered declined.

BEGINNING of April.—An ASSISTANT, accustomed to Dispensing and light Retail. Apply, enclosing carte, particulars, &c., to W. RANSFORD, Clevedon, Somerset.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 717.] SATURDAY, MARCH 22, 1884. [PRICE FOURPENCE

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EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

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Members and others desiring to exhibit objects of interest will oblige by communicating with the Curator of the Museum as early as possible.

Papers intended to be read at the Meeting on April 2nd should be forwarded to the Secretary not later than Wednesday, the 26th inst., as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, may be obtained from the Secretary, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

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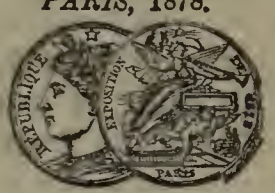

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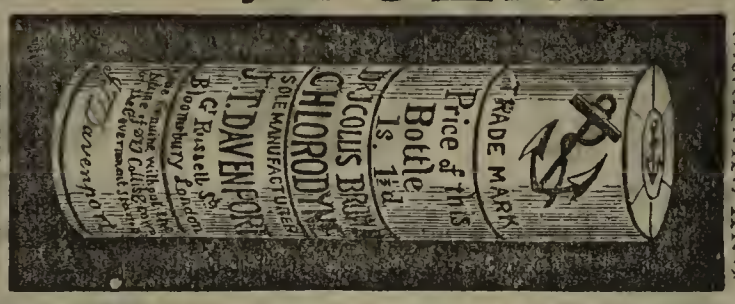

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This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

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GENERAL BOARD of HEALTH, London, REPORT that it ACTS as a CHARM, one dose generally sufficient.

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To J. T. DAVENPORT, London.

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IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

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Baiss Brothers,	,,	Goulding, Messrs.	Cork.	Oldham, G., & Co.	Dublin.
Banks & Richards,	Birmingham.	Grattan & Co.	Belfast.	Parsons & Richardson,	Leicester.
Barron, Harveys & Co.	London.	Grimwade, Ridley,	London.	Peake, Allen & Co.	Dublin.
Bell, John & Co.	,,	Grindley & Son,	Chester.	Raimes & Co.	Liverpool.
Corbyn & Co.	,,	Hearon, M'Culloch & Co.	London.	Sang & Barker,	Edinburgh.
Cox & Gould,	,,	Hodgkinson, Tonge & Stead,	,,	Sanger, J., & Sons,	London.
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Ferris & Co.	Bristol.	Marsden & Sons,	London.	Woolley, James,	Manchester.
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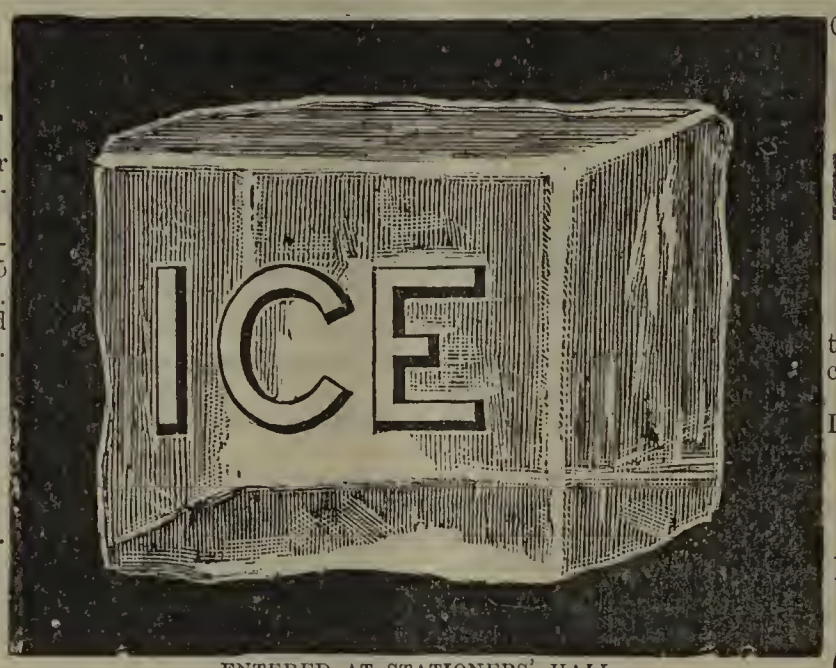

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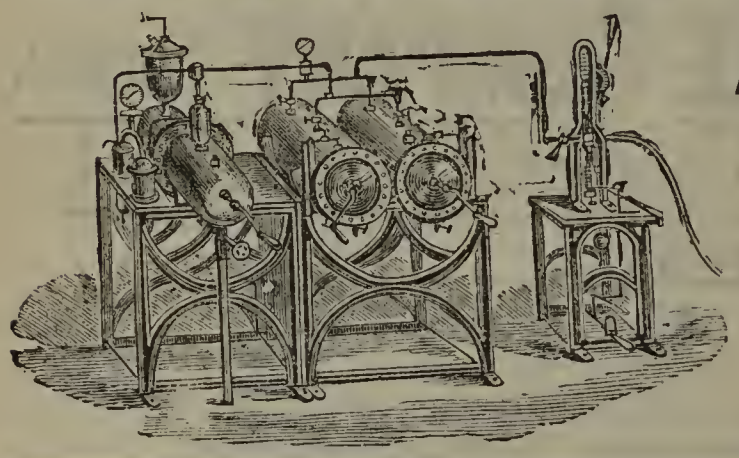

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THE MATERIA MEDICA OF THE NEW PHARMACOPÉE FRANÇAISE.

The list of articles of materia medica forms the first portion of the work (pp. 29–83) and is arranged alphabetically as in the last edition, the vernacular names being placed first and followed by the scientific names. As previously mentioned the chemical substances which formed a separate portion of the materia medica in the last edition are now arranged in the second part of the work, which is entitled 'Pharmacie Chimique,' so that in the new edition the materia medica includes only substances obtained from the animal and vegetable kingdoms. The list of these is still a large one, comprising four hundred and ten articles, of which one hundred and sixty-nine, indicated with an asterisk, are expected to be kept in stock in every pharmacy. In the last edition there were five hundred and thirty-five articles belonging to the vegetable and animal kingdoms, of which two hundred and six were marked with an asterisk.

In the preliminary chapter, in which directions are given concerning the collection and preparation of roots, leaves, flowers, etc., there is hardly any alteration. The term dicarpous (*dicarpiennes*) is introduced as synonymous with the term biennial. The very impractical direction to gather roots of perennial plants in the second or third year is still retained. Obviously it is next to impossible to ascertain whether such plants as tormentil, gentian, male fern, bistort, etc., are more than three years old, while the assertion that if older they are too woody and subject to diseases which alter their properties, is a somewhat sweeping one.

In this chapter also a note is added to the effect that the term root is often confounded with that of rhizome, and accordingly in several instances the term "rhizome" has been substituted in places where "racine" occurred in the last edition. The terms *rhizome*, *souche* (root-stock) and *racine* are, however, used with such a want of uniformity that it is difficult to understand what definition is applied by the authors to the respective terms.

The list of articles being such a large one, it will be more conveniently considered under the sections adopted in the work itself.

A.

The following are omitted:—Musk seed (abelmosch), the fruits of *Anacardium occidentale* (acajou) and *Semecarpus Anacardium* (anacarde oriental), *Alchemilla vulgaris*, *Anemone pratensis*, the bark of *Bowdichea virgilioides* (alcornoque), areca nuts, and the roots of *Aristochia Clematitis*, *A. longa*, *A. rotunda* and *A. cymbifolia*.

There is only one addition under "A," the entire plant of Arenaria rubra (*Spergularia rubra*), Pers. This is an introduction from Algeria, where it is used in cystitis, vesical catarrh, hæmaturia, jaundice, etc. The results obtained by Dr. Bourreau, in Paris, indicate that it possesses powerful diuretic properties, and is useful also in dysuria, gravel, nephritic colic, etc. M. F. Vigier, who analysed the plant, believed its properties to be due to the large amount of alkaline matter it contains, and to a resinous aromatic substance. Judging from the general properties of the family to which it belongs one would have expected it to contain a principle allied to saponine, but none was detected by M. Vigier. He found, however, that when distilled with water it gave an ammoniacal distillate (*Journ. de Pharm.*, [4], xxx., p. 371).

Alterations have been made under the following:—

Ache de Marais. *Apium graveolens*, L.—The authors appear to have been in doubt as to what to call the root of celery, the official portion being now described as "portion souterraine," instead of "racine," as in the last edition.

Aconit Napel.—The note directing that preparations of the leaf instead of those of the root should be always dispensed when the latter were not indicated in the prescription is now omitted, although both leaf and root are still official. No directions are given for distinguishing this root from the Japanese drug, nor for ascertaining its quality.

Agaric de Chene is now placed under the more familiar name of Amadou.

Alkékenge is now styled Alkékenge Coqueret.

Aloes.—Cape aloes is still the official species and the only one to be used unless directions to the contrary are given. *Aloe africana*, Mill., and *A. perfoliata*, L., are now mentioned as species yielding it, in addition to those mentioned in the last edition. Socotrine aloes is omitted, the following remark being made concerning it:—"Socotrine aloes, formerly the most esteemed of the African aloes, only comes into commerce casually." This is perfectly true; the aloes which arrives in this country and passes under the name of Socotrine aloes, is always of the hepatic character, or, if approaching Socotrine in colour and translucency, gives a crimson reaction with nitric acid, like that given by Barbadoes aloes (*A. vulgaris*, Lam.).

Amandes.—The botanical source is now given as *Prunus* (*Amygdalus*) *communis*, L., which is incorrect according to the generally accepted laws of botanical nomenclature, *Prunus communis* not being Linnæus' name for the plant.

Ambre Gris.—This intestinal concretion is now attributed to different species of Cetaceans, and not to *Physeter macrocephalus* alone.

Ammi officinal.—This is given under a cross reference as *Ajowan*, and the botanical source is now given as *Ammi copticum*, L. (*Ptychotis coptica*, DC., and *P. Ajowan*, DC.).

Aneth.—*Anethum graveolens*, L., is now referred to the genus *Peucedanum*, but without giving the authority for the new name.

Angélique officinale is referred to *Angelica Archangelica*, L.

Angusture vraie is now attributed to *Galipea Cusparia*, A. Sh. (*G. febrifuga*, H. Bn., and *Cusparia febrifuga*, H. B. K., being given as synonyms). Nitric acid is said to produce only a little coloured yellowish (*jaunâtre*) spot, on the internal surface of the bark, but in the samples tried by the writer of these notes it gave a dark reddish-brown colour.

Aristolochie serpentaire.—The term applied to the official part is changed from *rhizome* to *souche*.

Armoise (*Artemisia vulgaris*).—The word "*rhizome*" is substituted for "*racine*," and the same charge is made under "Arnica."

Arrowroot de la Jamaique.—Measurements of the granules are given.

Asa fœtida.—The botanical source of this drug is given as *Ferula Asafœtida*, L.. and *Ferula Narthex*, Boiss, and probably also *F. alliacea*, Boiss. The description of the drug is omitted. *Ferula alliacea*,

Boiss., yields, according to Dymock (*P. J.*, [3], v., p. 945), the asafœtida known in Bombay as Abusharee Hing, a dark coloured drug which contains about an equal quantity of slices of the root, and which never appears in commerce in Europe. The reason for inserting it here as a source of commercial asafœtida is not obvious.

ASARUM (*A. Europœum*, L.), and ASCLEPIADE or DOMPTE-VENIN (*Vincetoxicum officinale*), ASPERGE (*Asparagus officinalis*, L.).—The word "souche" is, in each of these, substituted for racine, while in Aunée, now Grande Aunée, rhizome is the term used to describe what is commonly called the root.

AYA-PANA. The synonym *Eupatorium triplinerve* is now used instead of *E. Aya-pana*, Vent. Ventenat is given as the authority for the former name, which by Pritzel ('Nomenclator Botanicus') is attributed to Vahl.

The articles Wormwood, Sea wormwood, Amadou, Alkekengi, Cape aloes, Almonds, Wheat starch, Star anise, Anise, Serpentary, Armoise (*Artemisia vulgaris*), the leaves, rhizome and capitula of Arnica, Arrowroot, Asafœtida, Asparagus rhizome, Elecampane, and Axunge, are the articles marked with an asterisk under "A."

B.

The following are now omitted:—Barbatimao Bark, Mecca balsam, Belladonna seeds, Ben "nuts" (*Moringa disperma*, Guib.), Baume de Liquidambar (*Liquidambar styraciflua*), the grain and gluten of *Triticum sativum* (Blé), Bois d'Aloes, Bois de Brasil Bois nephretique, Bois de rose de Canaries (Lignum rhodium), Buranhem bark (*Chrysophyllum leucophlœum*, Casaretti).

BALSAMITE ODORANTE: A new synonym, Baumecoq, has been added, and the Latin synonym, *Pyrethrum Tanacetum*, DC., omitted.

BAUME DU PERU NOIR.—The synonyms *Myroxylon Pereiræ*, Kl. (*Toluifera Balsamum*, var. *Pereiræ*, H. Bn.) are now adopted, and tests are added. The balsam is stated to be incompletely soluble in diluted alcohol, benzine and ether, giving a clear mixture with acetic acid, acetone, absolute alcohol, and chloroform.

BAUME DE TOLU.—The botanical name now adopted for the tree is *Myroxylon Toluifera*, H. B. K. (*Toluifera balsamum*, L.). The balsam is described as having an odour recalling that of benzoin and vanilla, and as being completely soluble in cold acetic acid, acetone, alcohol, and chloroform, insoluble in benzine and sulphide of carbon.

BELLADONNE.—The seed is now official, in addition to the root and leaves. The observation that the root should be recently dried and deprived of the base of the stem is now left out.

BENZOIN DE SIAM.—Is described as containing numerous and large tears and having a very pronounced odour of vanilla. Siam benzoin in lumps has disappeared from commerce of late years, and Siam benzoin consists entirely of loosely agglomerated tears rather than contains them.

BENZOIN DE SUMATRA.—This is described as having an odour of styrax, and the kind known in commerce as Penang benzoin is therefore probably intended to be used. Inferior specimens without tears and full of impurities are to be rejected.

BENOITE (*Geum urbanum*).—The "racine" is now become "souche." In the root of this plant the rootlets are all round the root, as in valerian, which is called a "racine."

BÉTOINE. The synonym *Stachys Betonica*, H. Bn., is now added. The authority for the name is, however, Bentham, not Baillon.

BISTORTE.—The word "rhizome" is substituted for "racine."

BLUET OU BARBEAU (*Centaurea cyanus*, L.).—The capitulum, instead of the flower only, is now made official.

BOLDO.—This by a printer's error is ascribed to *Pneumus boldus*, Mol. (*Boldoa fragrans*, A. Gray).

BRINVILLIÈRE.—A cross reference under this name, so suggestive of poison, is given to *Spigelia anthelmia*, L.

BUCHU or BUCCO.—The leaves of *B. crenulata*, Hook., and *B. serratifolia*, W., are now official, in addition to those of *B. betulina*, Bartl.

It may be noticed in passing that BUGLOSSE is not identical with the plant known by that name in England, but includes *Anchusa officinalis*, L., and *A. italica*, L.

Boldo and Belladonna seed are the only two new articles under the heading "B."

The articles marked with an asterisk are Bardane (Burdock root); Balsam of Tolu; African Bdellium; Belladonna root, leaf and seed; Siam Benzoin; Bitter orange, leaf and rind; Bistort root; Spermaceti; Bouillon blanc or Molène (*Verbascum Thapsus*, L.), and Bourrache (*Borago officinalis*).

(*To be continued.*)

SCANDINAVIAN PHARMACY.

ADAPTED BY JOSEPH INCE.

Monsieur Henry Labonne, a Paris pharmacien, has addressed a series of letters to the *Union Pharmaceutique*, and the *Bulletin Commercial*, on the pharmacy of Sweden and Norway, describing his personal experience in those Northern regions. Probably a sketch of some of the more salient incidents of his narrative will interest the English reader.

The route lay through Denmark, Sweden and Norway; across Lapland and as far as North Cape, the furthest extremity of Europe.

The external aspect of a pharmacy is first described, taking as an example the chief laboratories and business premises of Drontheim. This is not the capital but only an important town of Norway.

The house of the Apotekare, like the rest, is made entirely of wood; very large, very clean, and painted white. In front is a large garden; and in this every or almost every indigenous pharmacopœial flower is represented. Add to this, a sundial, a barometer and thermometer visible from a long distance; shells and minerals to form borders; and you see that it is in truth the garden of a *savant*.

It is significant that we reach the Pharmacy by the Apotek gata, that is Pharmacy Street. In all provincial towns in France there is a Church Street, and even a Vicarage Street; but here there is one in honour of Pharmacy. This small fact shows that in these parts the pharmacist is *somebody*, or at least that a Laboratory goes for *something*. The interior presents no peculiarity: a set of bottles on shelves, and scales upon a counter have much the same aspect everywhere.

The master is always well dressed, generally in a frock coat and with a white cravat. He wears this costume not only in town but out in the country; a fact demonstrated in a very small village, to give

but one example, between Ostersund and Stockholm.

This village contained altogether from about fifteen to twenty houses, built on a rock; wooden thatched houses only. One amongst them looked like a chateau compared with the rest; on approaching we read with surprise, Apotek.

The pharmacien was in his garden with madame and the household; their dress, almost parisian, and in keeping with the appointments of the house, was in strong contrast with that of the people of the place, who wore the motley costume of Sweden, reminding one of Italy, both by its brilliant colours and the absence of shoes.

Just now thatched roofs were mentioned. These are clods of earth, or more often turf placed on a frame of wood; but their appearance differs altogether from that of French cottages. The roof of the latter is frequently covered with mosses, but moss alone is allowed to grow. In Norway, on the contrary, the wind transports on to these clods of very fertile turf every imaginable grain; and as the inhabitants religiously respect these seeds, the result is that, seen from a distance, these houses of the hamlet seem to have a garden on the top by way of covering; all the more so as this is the country blest by flowers, the native land of the great Linnæus.

There is a reason for the homely construction of these houses; the granite is very hard to work, while fir wood on the contrary costs scarcely anything, and wood houses are warmer than those built of stone. That seems paradoxical, but you have only to enter and see how carefully the smallest cracks are closed by wool, and to reflect that wood is a very bad conductor and consequently that the heat of their comfortable stoves is retained, and you will acknowledge that the construction is quite right.

Unfortunately there is a reverse side to the medal. The first thing you read in any guide respecting any town is that it has been several times destroyed by fire, for which reason there are no ancient monuments in these Northern towns. That also explains why each street and square at Drontheim looks like a field; the fear of fire inspires a dread of overcrowding buildings.

Now let us see something about organization, course of study and practical pharmacy in Scandinavia.

Under the first provisions of legislation no one could establish a pharmacy (apotek) without having obtained the permission of the king. This privilege was only accorded to a new pharmacien in respect of a definite pharmacy in a specified part of the country. But soon the same thing happened as in the case of the tobacconists of France. Those who had obtained the right sold their privileges and many grave inconveniences were the result.

At first the proprietor, taking advantage of competition, only allowed the working of his business to the highest bidder. The latter having bought so dearly soon became hampered by debts and was a struggling man. The matter was complicated by the insecurity arising from the doubtful legal character of his transactions; they were not permitted by the law, but only tolerated by use and custom. To remedy this state of things, legislation distinguished between two sorts of pharmacies (1834).

1. Those just mentioned, designed under the name of privileged royal pharmacies, on condition that the owner should only sell his right by sanction of the king.

2. Personally privileged establishments; the privilege forbidden to be sold. If the pharmacy became vacant, the king, on demand, could award it to another pharmacien in possession of a diploma.

In spite of that, many legal projects had for their object the total abolition of the sale of privileges. Lastly, by an edict of 1873 all traffic of the kind will cease in 1920.

At the present moment (1883) there are only twenty-five pharmacies at disposal; one hundred and sixty-four are *personal*, with forty branch shops called *filial apotek*. The same term occurs in Germany: the French word "succursale" is never used.*

To ensure the cessation of these twenty-five marketable pharmacies a regulation has been adopted.

The interested party up to 1920 receives his privilege at a valuation; the pharmacy thus becomes *personal* on condition always of the repayment to the State every six months of a certain sum calculated with regard to ultimate redemption. In a few years there will be but one class—namely Personal Pharmacies—in Scandinavia. In Sweden where there are four millions and a half inhabitants, their number will amount to about two hundred and thirty. It is true that many of these inhabitants, as the Lapps and the Finns, are not great consumers of pharmaceutical products.

But if pharmaciens are thus protected, they are under certain obligations.

All must be members of the Pharmaceutical Society founded in 1821. Moreover, they are divided into districts, one pharmacien in each district being appointed chief.

The Pharmaceutical Society supports an institute or school where studies for the acquirement of the legal grade are conducted. This pharmaceutical institute is at Stockholm and was founded in 1845.

Independently of the Pharmaceutical Society, it is under the superintendence of the medical department or Collège de Santé of Sweden. The direction of the institute is composed of professors and of two delegates chosen by the Society. Every year a professor must report to the College on the working of the school. If the Society has exhausted its funds, the Diet, or National Assembly, will come to its aid. There are four chief professors, two laboratory assistants, one tutor, making seven in all.

It now remains to describe the regulations under which the diploma of Pharmacien may be gained.

The candidate for a diploma in Swedish-Norway must begin by an apprenticeship of from three to six years in a business house. Then he passes the examination of pharmaceutical student before several pharmaciens and one medical man. Without this examination he is not admitted to the courses at the School of Pharmacy, where alone he can pass his final pharmaceutical examination.

These are not the only formalities to be observed in order to become a student in pharmacy at the school or institute. A year must elapse between his first examination and registration; and he must be provided with certificates from the pharmacien with whom he has served his time. These certificates must declare that he has worked in the laboratory

* Note by Translator. The word "affiliated" is employed by English universities to indicate a dependent college.

for at least one year. Lastly, before admission he must pass in Latin, materia medica, natural history, chemistry and mathematics.

Let us suppose that our young student has successfully complied with the regulations and that he has now entered at the School of Pharmacy; let us see what remains so that he should gain his diploma. His studies are about to finish and but three months remain before he undergoes the last ordeal. On these three months depends his success, for now he must give proof of his practical instruction.

From a literal translation of the Swedish it appears—

1. He must show skill in dispensing a prescription. He must prepare emulsions, ointments, etc., before the teacher of pharmacy.

2. In presence of a professor of chemistry and pharmacy he must make two mineral assays, chemically prove the purity of some substances used in medicine, and detect a poison in a mixture.

3. [An examination which has no analogue in France.] The candidate must answer trade questions put to him by a pharmacien of the town, on suitable methods for preserving remedies, and on a knowledge of prescriptions and pharmaceutical regulations.

4. The professor of natural history and pharmacognosy must ask questions on zoology; particularly on the application of this branch of study to the practice of our art; on posology or the study of doses; and lastly on an acquaintance with the most important antidotes.

5. The candidate must produce his analyses and reports in writing, and reply to two examiners (one chemical, the other pharmaceutical) chosen by all the professors united.

If all goes well the student has only to show his certificates of reception at these multiplied and severe examinations to be rewarded with his diploma; provided always that the fee to the Pharmaceutical Society has been paid.

(*To be continued.*)

HAMAMELIS VIRGINICA.*

The so-called witch hazel derives its name from the similarity of its leaves to those of the English hazel (*Corylus Avellana*, L.). The latter has been used from time immemorial as the attribute or divining rod of witches, and in the earlier days of the American Colonies the American "witch hazel" was made to do duty in place of the English.

The witch hazel (*Hamamelis virginica*, L.), which is also called, in some sections, "winter bloom," "snapping hazel nut," "spotted alder," etc., occurs in nearly all parts of the United States, chiefly in damp woods and thickets, along the moist banks of rivers east of the Mississippi, from the Mexican Gulf to Canada, but according to Pursh, also on hills and in stony places. Usually it is a bush or tall shrub but sometimes attains a height of 20 feet. Like many other Eastern American trees and bushes, it blossoms late in autumn, from September to November, when the leaves are falling, and contributes its share to the many-coloured hues of the forest in the fall of the year. Bigelow† says of it:—"Among the crimson and yellow hues of the falling leaves there is no more remarkable object than the witch hazel, in the moment of parting with its foliage, putting forth a profusion of gaudy, yellow blossoms, and giving to November the counterfeited appearance of spring."

Its Latin name, *Hamamelis*, is borrowed from the Greek, and was applied by the ancient Greeks to a kind of quince, medlar or pear, but the identity of this cannot now be recognized. It was interpreted by the ancients as meaning "resembling an apple tree," being evidently applied by them to a tree bearing a fruit resembling apples. It is, therefore, rather singular that Linné should have selected this term to denote our witch hazel, which certainly does not fit the above comparison.

G. B. Emerson* says of it:—"The union, on the same individual, of blossoms, faded leaves, and ripe fruits, not very common in any climate, led Linnæus to give to an American plant a Greek name significant of the facts of its producing flowers together with the fruit." Of course, this interpretation is not correct, no such meaning being contained in the term. But the curious appearance of old leaves, flowers, and fruit, on one and the same shrub, is by some supposed to have originated the name "witch hazel."

That the popular notion of the mysterious power of witch hazel, resembling that originally ascribed to the European hazel, was quite prevalent in this country even before the Revolution is testified to by Carver,† who says:—"It is said to be possessed of the power of attracting gold and silver, and that twigs of it are made use of to discover where the veins of these metals lie hid; but I am apprehensive that this is only a fallacious story, and not to be depended on; however, that supposition has given it the name of witch hazel."

A paper in Hutton's 'Mathematics,' and another, by Alfred Burnson, of Prairie du Chien,‡ give some wonderful stories about the power of witch hazel in discovering water. And Porcher§ relates that persons in the upper districts of South Carolina pretend to use the rod with success.

The shrub usually consists of several crooked branching trunks arising from the same root, some 4 to 6 inches in diameter, 5 to 12 (sometimes 20) feet in height, and covered with a smooth, brown bark, the older bark becoming brownish-grey and fissured, and the inner portion being whitish and smooth.

The fruit is a light brown, nut like, roundish oval capsule or pod, two-celled, which incloses the seeds, but soon bursts elastically into two pieces. It ripens in the summer of the succeeding year.

The two seeds are shining black, with a white hilum; are white, oleaginous and starchy within, and are eatable like hazel nuts. The seed of trees grown abroad germinates but rarely; the plant is there usually propagated by cuttings which strike root very slowly.

There is only one other distinct species of *Hamamelis*, namely, *Hamamelis japonica*, and this differs only by slight characters, namely, by its having more leaf nerves, broader and revolute, brown calyx lobes, and a shorter fruiting calyx.

Medical Uses.

Both the bark and the leaves are used medicinally. The United States Pharmacopœia (1880) recognizes only the leaves, though it would appear that the bark is much more extensively used. Both have a certain degree of fragrance, particularly when fresh, and, when chewed, are at first somewhat bitter, quite astringent, and leave a pungent, sweetish and persistent after-taste. Water as well as alcohol extracts their virtues. They appear to contain, according to Dr. A. Lea, besides the usual plant constituents, a peculiar bitter principle; this author

* The plant is figured in *Curtis' Botanical Magazine*, No. 463, tab. 6684. Reprinted from the *American Druggist*, January, 1884.

† 'Florula Bostoniensis.' 8vo. Boston, 1814, p. 40.

* 'Report on the Trees and Shrubs . . . . of Massachusetts,' p. 472.

† 'Travels through the Interior Parts of North America in the years 1766. 1767 and 1768,' by J. Carver. 8vo. London, 1781, p. 509.

‡ 'Patent Office Report on Agriculture,' 1851, p. 16.

§ 'Resources of the Southern Fields and Flowers.' 8vo. Charleston, 1869, p. 62.

also first drew attention to the large amount of tannin they contain.*

Witch hazel is reputed to be tonic, astringent and sedative. A decoction of the bark (1 oz. to 1 pint) has been found useful in hemorrhages, as well as in diarrhœa, dysentery and excessive mucous discharges. Its supposed beneficial effect in incipient phthisis, where it has been thought to unite anodyne influences with its others, is probably unsupported by facts.

The bark is reported to have long been known to the Indians—which is not at all surprising—as an excellent remedy in swellings and tumours of a painful character, as well as in external inflammations, applied in form of a poultice.

When the negro slaves endeavoured to procure abortion by means of cotton root, miscarriage is said to have been prevented by hamamelis. This is vouched for by Dr. W. W. Durham,† who says:—"At one period of my practice, the negroes used the cotton-root so frequently to produce abortion, that my supply of black haw [*Viburnum prunifolium*, recommended in 1847 by Dr. Phares, of Newtonia, Miss., as an antitocic], became exhausted, and, having heard of the power of the hazel to effect the purpose for which I used the haw, I resorted to it (the hazel) with perfect success. Having only used it for the purpose of preventing abortion from the effects of the cotton-root, I cannot speak of it in other cases."

The decoction may also be used advantageously as a wash or injection for sore mouth, painful tumours, and is probably useful in any cases where a local astringent is indicated, as in leucorrhœa, gleet, conjunctivitis, etc. Professor Stillé states that he has known the decoction or infusion to be used, as a lotion, with apparent benefit, in crusta lactea.

An ointment made with lard and a decoction of white-oak bark, apple-tree bark and witch hazel bark, has been found a valuable application to piles. The same is very generally reported of the so-called white extract of witch hazel, which is said to be made by distilling the fresh bark with a very dilute (6 per cent.) alcohol. This preparation is a popular external remedy in sprains and bruises, and is besides vaunted as a cure for almost every disease flesh is heir to.

Dr. King states that he has used a decoction of equal parts of witch hazel bark, golden seal root (*Hydrastis canadensis*) and lobelia leaves—a strong decoction being made from the first two, then the lobelia leaves added—as a lotion in ophthalmia, with such success, that he succeeded in curing even the most obstinate and long-standing cases; and he adds that other practitioners to whom he communicated this fact have confirmed it.

The decoction was also highly recommended by Dr. James Fountain,‡ of Peekskill, N.Y., and Dr. N. S. Davis,§ in hemorrhage of the lungs and stomach.

Besides the colourless, or distilled "extract," there are several other popular or proprietary preparations, mostly made, probably, by dissolving the soluble parts of the residue left on distilling the bark or leaves.

THE CARDAMOM HILLS OF TRAVANCORE.‖

A correspondent of the *Madras Mail* gives the following account of the cultivation of cardamoms in Travancore:—

I spent several days at Odumenshola, and in various visits to the neighbouring Tavalum and gardens, as well as on road-making rounds, I had many opportunities of watching the work of collection and curing the cardamoms. Our ride to a large Tavalum was very interesting as we passed through miles of cardamom forest through which bridle paths had been cut. The Tavalum we visited was some distance beyond the forest, and was a busy scene, as a large amount of cardamoms were being dried on the natural barbacues of rock, and women and children were busy stripping the capsules off the scapes that had just been brought in. From here we rode over a pretty undulating grass country to Callapara where A. had a large permanent camp for warehousing the cardamoms from the neighbouring forests.

From what I could learn there are two varieties of cardamom in the Travancore forests. One crop comes to maturity about October, and the other in January. The varieties appeared to be caused by difference of rainfall and soil; the former growing in a misty wet climate, and poorer soil than the other, which grows in a comparatively dry climate, and fine rich soil. My small experience was confined to the latter variety. Land having been selected, the superintendent has to be applied to for leave to open the garden. Nothing is charged in the way of assessment till the garden comes into bearing, when a rate of 10 per cent. on the crop is charged for land tax. Only certain forests will grow cardamoms, and the presence of a few wild plants is a safe indication of the suitability of the soil. They will not grow in bamboo or reed jungle, nor will they thrive under mungamurrum, mella-murrum, or dammer trees. The best aspect is a northern one and a steep incline is better avoided. The finest gardens, I noticed, were on easy undulating land, and in such situations I was informed they lasted for years. The opening and preliminary work is very simple. Operations begin in April by the cutting down of all undergrowth to 6 or 8 inches in diameter; and here and there large trees of rapid growth are cut down. No burning is done as in coffee clearings, and the felled branches and undergrowth are allowed to rot. In the following October the young cardamoms begin to sprout. Where they are too crowded, it is necessary to thin them out and transplant them into the open spaces, and where the plants have sparely sprouted, it is also usual to sow the ground with seed. The seed should be sown before the monsoon. The growers prefer stocking their gardens with spontaneously grown plants, which they say last longer and come late, bearing earlier than those grown from seed. For two years nothing further is done. In the third the clearing should be weeded, and the small sprinkling of crop gathered. In the fourth year a thorough weeding ought to be done, and the decayed stocks and leaves heaped up between the clump of cardamoms. The garden is now in full bearing, and will require regular attention. The weeding should be done in November, and the crop comes immediately to maturity with the letting in of light and air. Cardamoms require light showery weather in March and April, when the flowering scapes are ready to blossom. In rich soil the scapes will run out to 3 and 4 feet in length, but shorter growths give better results in the way of crop. The failure of showery weather immediately after the blossom will ruin the prospects of the crop, and though the scapes will sometimes throw out a second blossom, the result is generally a poor one. The fluctuations of crop are therefore great, and as hail storms often occur about the blossoming time, the risk and uncertainty of crop is much increased. Cardamoms begin to ripen in November, but it is often late in January before the growers will pick the crop, and a great deal is destroyed by snakes, rats and vermin of every description. Judging from what I saw in the garden, of capsule shells, probably one-third is lost in this way. Chetties from the neighbouring villages in the Madura district are the principal growers, and they usually begin the cardamom harvest when about half the remaining capsules on the scapes are ripe.

The scapes with the cardamoms on are removed to the small collecting stations, and cured by a process of drying in the sun and exposure to the dew. The morning after

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* Tilden's *Journ. of Mat. Med.*, Feb. 1868. See also H. K. Bowman in *Amer. Journ. Pharm.*, 1869, 164.

† *Atlanta Med. and Surg. Journ.*, 1867, and *Richmond Journal*, January, 1868.

‡ *New York Journ. Med.*, x., 208.

§ 'Trans. Amer. Med. Assoc.,' i., 350.

‖ Reprinted from the *Tropical Agriculturist*, February 1, 1884.

the collection the capsules are carefully removed from the scapes, and dried on the rocks. The fleshy shell soon loses its green or brown colour under the three or four days' drying, and is then fit to be removed to the weighing stations. Cardamoms lose two-thirds, three-quarters, or even four-fifths of their measure by drying; the exposure to dew is supposed to give a bleached look to the sample. Some cardamoms I noticed had a green tinge which no amount of drying could remove, and was supposed to be caused by the nature of the soil they came from. Could the crop be gathered in, as it ripened, there is no doubt a much better sample could be secured, but I was informed that it would not pay the growers to do this, as the Travancore Government made no distinction in the price for bad or good qualities, and the result was the loss of much of the ripe fruit and the character of the rest being damaged by indiscriminate packing of mature and unripe capsules together. A second curing and winnowing is given at the weighing stations, and there is a further drying and winnowing on the coast when the cardamoms are ready for the buyer. On the coast the best descriptions will realize as much as 4 rupees per lb. (Dutch) but the grower only receives a third of this, and when all deductions from this third are made for watchmen, land tax and other petty charges, the amount really paid is nearer one-fourth than one-third. From notes taken of the cost of cultivation, I was doubtful whether the growers could make anything by the transaction, but the fact of their continuing to cultivate is proof that they do make something. A. considered it paid the growers if they secured two good crops to three bad ones; but he admitted that it was very difficult in bad seasons to get the owners to take in their crops, and he had often to do so at the Government's expense. At one time the produce had been as high as 3000 cwt., but had subsequently dwindled down at a tenth of that quantity. Since A.'s incumbency more land has been opened up and abandoned gardens brought into cultivation, and he had lately a crop of 1500 cwt. A more liberal policy on the part of the Travancore authorities would soon double the cultivation. Nearly all the cardamom growers are British subjects, owing no doubt to the fact that the forests, as far as the Pereyaur, had once been under British jurisdiction. About the second decade of this century, this tract was transferred to the Travancore Government, and the cultivators who were British subjects continued their occupation under the new rule. Roughly estimated, about 20,000 acres were under cultivation, and from what I could learn there was forest land enough available for extending the cultivation five-fold. The yield an acre in even favourable time does not exceed 20 to 25 lb. of cardamoms.

In addition to cardamoms the Travancore Government collect ivory, wax, gallnuts and other hill products, and obtain some revenue from teak and blackwood, and also from cattle grazing fees. Altogether the average nett revenue comes to about 2 lakhs of rupees. No land is granted for otherwise than cardamon cultivation—a wise policy on the part of the Travancore Government, as without losing their forests they obtain a safe though fluctuating revenue. Still there is a good deal of land suitable for grain cultivation which is not allowed to be cultivated though ready with a light tickling of the surface to yield fine crops. The wandering hill tribes in return for Sircar service are alone allowed to grow any grain, and they are restricted to old nursery clearings.

Though the cardamom hills are unoccupied at present by any resident population, there was a time when they must have been inhabited, as ruins of forts, rude carvings, and inscriptions plentifully testify, but there are no traditions of the old inhabitants, and the present hill tribes, according to their own account, are but comparatively recent settlers. The present hill men are of either Tamil or Malayalam origin, and seem to have settled on the hills in the last three hundred years. They are fine men in physique, though living in feverish places, and according to census returns are on the increase. The railway has made the country accessible, as twenty-four hours from the Railway Station of Ammanackenoor would land the sportsmen at some of the finest shikar ground in Southern India.

EMULSION OF COD LIVER OIL.*

BY C. F. SCHLEUSSNER.

The number of formulas already in print is legion, yet the one I have had in use for a long time is one that gives such entire satisfaction to patient, prescriber, and myself, that I think it worthy of more extended knowledge. The formula is not original with myself, but is already in possession of many others of the fraternity, and has in the hands of almost all of them proved a success.

Some, however, have *failed* in the manipulation, and this I think must be due either to unsatisfactory materials or fault in the labour bestowed upon the shaking process. The formula is as follows:—

Powdered gum arabic . . .	180 grains.
Powdered tragacanth . . .	180 grains.
Powdered arrowroot . . .	180 grains.
Cod liver oil	24 fluid ounces.
Syrup	4 fluid ounces.
Water	20 fluid ounces.

The manipulation should follow *exactly* the following directions:—The powders are rubbed in a porcelain mortar of 8 ounces capacity with a small quantity of cod liver oil to a thin smooth paste, more oil being gradually added until 4 or 6 ounces have been added, when it is to be poured into a 5-pint bottle, *which must be clean and perfectly dry*; more oil is then put into the mortar to rinse it, and poured from it into the bottle, adding the balance of the oil. The bottle is then to be vigorously shaken to distribute the powder thoroughly through oil, then add *twelve* fluid ounces of water *all at once*, and shake the bottle *thoroughly, vigorously, and continuously for ten minutes*, when the remaining quantity of water and syrup may be added *all at once*, and the shaking again continued for about two or three minutes.

The yield is three pints of finished emulsion.

Nothing has been said in the above about flavouring, or the addition of other articles so often used in emulsions, such as the hypophosphites, etc.

The emulsion may be made as a stock emulsion by omitting from the above quantities *four ounces* of the water from the last quantity. When desired for any special prescription, it will only be necessary to dissolve the salts ordered or needed in enough water to make six fluid drachms, and pouring some emulsion in a pint bottle, add the solution to it, shake well for a few seconds, then add enough of the stock emulsion to make a pint. Flavouring, dilute sulphuric acid, or any other materials may be added by a similar method in place of a portion of the water omitted.

I have used this method for many months with *entire success* and satisfaction; it keeps well, does not form a crust to the same extent that do many other emulsions, and is more fluid than many that are offered. It has also the advantage of less expense in mucilaginous material.

This formula was temporarily adopted by the New York Committee on unofficial formulas, and was made in their presence to entire satisfaction; yet on being repeated by some members of the committee in their own stores they failed to reproduce as satisfactory an emulsion as that shown the committee and made by them. I can only add that it has never failed in my hands, and that in other instances it has succeeded perfectly on the first trial with others. I only repeat, that if the directions given are *strictly followed* it will never fail. The chief points are best quality of powdered gums and oil, a *clean dry* bottle of *twice* the capacity of total ingredients, vigorous and continuous shaking for ten minutes, the addition of the water *all at once* at the times indicated.

* From the *Pharmaceutical Record*.

The Pharmaceutical Journal.

SATURDAY, MARCH 22, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

MR. WARTON'S BILL TO RESTRICT THE SALE OF PATENT MEDICINES.

PROPHECY, even when only implied, has once more proved to be a risky occupation, for close upon the heels of a very recent somewhat pragmatical assurance that the scheme of Mr. WARTON for dealing with the sale of patent medicines containing poisons "has never had any concrete existence, nor is it likely to have such," the printed Bill has made its appearance. As a copy has been received only just before the time for sending this Journal to press we shall content ourselves now with briefly summarizing what would be the effect of the provisions contained in the seven clauses, the text of which will be found on another page, since in the prospect of a Government measure on the same subject this Bill has not the importance it might otherwise have had.

The legislation proposed would be based upon the presumption that until otherwise proved and authoritatively declared every patent medicine should be deemed a poison within the meaning of the Pharmacy Act, 1868; and, therefore, as the words in the sixteenth section of the Pharmacy Act exempting the making or dealing in patent medicines from the operation of the previous fifteen sections would be repealed, all such articles would come within the general scope of the regulations affecting the sale of scheduled poisons. In order, apparently, to afford an opportunity for the removal of preparations free from poison from this category, it is provided that any person interested in a particular patent medicine, or a vendor or purchaser, may require the same to be analysed by the Pharmaceutical Society of Great Britain, and that if it be found free from any scheduled poison the Society may pass a resolution containing a declaration to that effect, which, upon approval of the Privy Council, would be published in the *London Gazette*. After the expiration of one month from the date of such a notification the proprietor or vendor of this particular preparation would be entitled to affix to the containing vessel or wrapper a label bearing the words, "free from poison." If, on the contrary, the preparation should be found to contain a scheduled poison, a resolution of the Society to that effect, after approval by the Privy Council, would be advertised in the *London Gazette*, and a month hence the preparation would be deemed to be a poison within the meaning of the Pharmacy Act, which indeed, by the provision before mentioned, it would already have been before any analysis. Possibly, however, this provision contemplates the desirability that might sometimes arise for the re-examination of a preparation that has been declared free from poison. It will be observed that no provision is made for the expenses that would be incurred in carrying out this work on behalf of the public.

GLEANINGS IN THE SOUTH-WESTERN PROVINCES OF CHINA.

THE interior of the enormous Chinese empire is still to the Western world so nearly a *terra incognita* as to render all fresh trustworthy information respecting it extremely acceptable. Such a contribution has just appeared in the form of a parliamentary paper containing an account of a four months' journey made in the early part of last year by Mr. HOSIE, a consular agent, through a considerable portion of the important provinces of Se-chuen, Yun-nan and Kuei-chow in the south-west of China. It is principally in these provinces that, in defiance of Imperial edicts, the cultivation of the poppy has been introduced and persevered in, until now it seems to be a tolerated industry, and home-grown opium has become in China a powerful competitor with the Indian drug. Scattered here and there among the observations made on this journey are several that appear to possess sufficient interest for the readers of this Journal to make them worth culling and binding together in a note. The starting-place was Chung-king, the great trade emporium of the province of Se-chuen, and the first objective point was Cheng-tu, its capital, lying about two hundred miles to the north-west. Along the road between these two towns the poppy was a frequent crop, more land being devoted to it in some districts than to anything else; indeed it is there cultivated to such an extent as to affect the price of corn and all other commodities. Nearing the capital the safflower was met with, but here, as in India, its cultivation is decreasing under the joint competition of opium and foreign dyes. Orange groves were also passed, and it was noticed that everywhere the skin of the orange was carefully collected and preserved, the epidermis and the white inner layer, when separated, both finding a place in Chinese medicine. Along this route and everywhere throughout the province there was an abundance of the Chinese "wood oil tree" (*Elæococca vernicia*,) a Euphorbiaceous plant, from the seeds of which an oil is expressed that is used by painters; the tree was also met with in the provinces of Yun-nan and Kuei chow. Besides coal, a common fuel in this district is charcoal made from ferns, which are placed in a pit and allowed to smoulder, water being constantly sprinkled on the heap to prevent a blaze. A detour

was made to visit the famous salt and fire wells at Tzu-liu-ching, where side by side with the sources of the brine are found the means for its evaporation. The fire wells would appear to be associated with petroleum deposits, and give forth an inflammable vapour which is conveyed through bamboo tubes lined with lime to the furnaces where it is burnt under the evaporating pans. The brine varies in quantity and quality; sometimes it is black and sometimes yellow, the latter yielding about half as much salt as the former. The black brine is obtained from a depth of at least two thousand feet and the yellow from seven or eight hundred feet. When the supply is good upwards of three hundred "buckets" of black brine and six or eight hundred of yellow may be obtained in a day. The "buckets" would appear to be large and the brine strong, since it is stated that a bucketful of black brine yields upon evaporation about twenty-four pounds of salt, worth from 6*d*. to 9*d*. The low price of the salt, however, does not save it from adulteration, since we are told that in the manufacture of granular salt bean flour is added to improve its colour.

After reaching the capital of Se-chuen the travellers turned south-west, passing through a fertile plain and reaching Ya-chou, which is considered to be the centre of a medicine-producing country. Here "huang-lien," or gentian, sells for more than its weight in silver, and "hou-po," the bark of the *Magnolia hypoleuca*, is valued at 15 to 30 taels (£4 8*s*. to £8 16*s*.) per catty (1⅓ lb.), the product from the wild tree being most esteemed. It is curious, if not significant, that here and subsequently, next to tea, medicines and coffin boards formed the principal articles of trade. Brick tea is manufactured in Ya-chou, and is said to differ from the article made under the same name at Hankow in consisting of the entire leaf and twig loosely pressed together, whilst the Hankow brick-tea is tea-dust firmly compressed into actual brick shape. Still travelling south and bending towards the west of Yun-nan, the valley of Chien-chang, the great white wax insect egg-producing district, was reached. Wax is not produced here however, since, according to Mr. HOSIE, the insects are not reared on the wax-tree, but on a tree called the "tung-chien," and are exported to the districts where the wax-tree is cultivated. If this observation be correct it will help to clear up some obscurity with reference to the origin of the Chinese white wax. The perseverance of the late DANIEL HANBURY established it beyond reasonable doubt that one tree, at least, upon which the Chinese wax insect feeds is a species of ash (*Fraxinus chinensis*, Roxb.); but he mentioned in his first communication that the wax had also been attributed to a plant bearing the name "tung-tsing," variously spelt "tong-çin," "toung-thsing," etc., which has been referred to various species of *Ligustrum*. Mr. HOSIE speaks very distinctly on the subject. He says:—"It has "been hitherto a matter of surprise that the valley "of Chien-chang should produce the insects and "not the wax, and Chia-ting the wax and not the "insects. The reason is perfectly simple however. "In the prefecture of Chia-ting the wax tree is ex-"tensively grown; in the valley of Chien-chang it "is not. On a small twig of the 'tung-ching' tree, "which a dealer in wax insects has just given me, I "find half a dozen round excrescences about the size "of a pea, and innumerable smaller excrescences, like "minute shellfish, clinging to the bark. On opening "one of the brown glazed pea-shaped excrescences, "thousands of minute whity-brown creatures, whose "movements are all but imperceptible to the naked "eye, are seen. In less than a month hence these ex-"crescences will be collected, transported and sus-"pended on the branches of the wax tree. At first "they spread themselves on the upper side of the "leaves during the night, but hide during the day "from the sun under the leaves. After a time they "spread over the branches and secrete the wax. A "little wax is on the twig of the tung-tching tree "which I hold in my hand."

Among the articles of medicine observed in Se-chuen province, Mr. HOSIE mentions "China root," by which, however, he does not mean the rhizome of *Smilax China*, usually designated under that name, but the curious fungoid growth of a species of *Pachyma*,—resembling the "tuckahoo" or "Indian bread" of North America,—which is found on the roots of old fir-trees. Another medicinal substance, "tu-la," was met with after crossing the Yun-nan frontier, which is described as a "brown root-like substance, found underground in the hills." It has a bitter taste, resembling that of quinine, and is said to be efficacious as an antidote to opium and in the treatment of fever. This is not the only case in which a regret arises as to the limits of the traveller's scientific knowledge. In one place he vouches for having inspected a specimen of coarse dusting cloth, "manufactured from the fibrous roots of a coarse grass," the peculiarity of which is that "when it is "dirty it is put in the fire, the dirt is consumed and "the cloth is taken out clean and uninjured and "ready for use." In Yun-nan poppy cultivation and opium collection were noticed almost everywhere, the purple and white-flowered varieties being grown in this province. This province also contributes armadillo skins for use as medicine in the more northerly parts of China. In the southern part of the province of Kuei-chou the proportion of land under poppy cultivation appeared to be still larger than in Se-chuen or Yun-nan, the poppy grown here being a white-flowered variety edged with pink, whilst further north the red and purple-flowered varieties become more common. Before concluding this notice mention may be made of a practice not devoid of a touch of humour. On several occasions Mr. HOSIE'S attention was attracted to travellers wearing official hats, which he was told

indicated that they were candidates making their way northwards to attend the competitive examinations in Pekin. The statement appeared, however, inconsistent with the large quantity of luggage they carried, until the mystery was cleared up by the information that as examination candidates from the provinces travel with a pass exempting their luggage from all taxes *en route* to Pekin, such persons usually carry with them a good supply of opium and Ta-li marble, so that in the event of their being "plucked," they have some consolation in being able to return home with pockets better lined than when they set out, as the result of a little bit of smuggling.

The Medical Acts Amendment Bill passed through Committee in the House of Lords on Thursday.

* * *

On Tuesday, in the House of Commons, in reply to a question, Mr. Hibbert said that it was the intention of the Government to bring forward a measure dealing with the storage of petroleum, after Easter, and that probably it would be thought necessary to introduce the Bill into the House of Lords.

* * *

On Tuesday another decision upon the law relating to the registration of trade marks was contributed by Mr. Justice Chitty. The case was an application to register as a trade mark for extract of meat a device consisting of a portrait of the late Baron Liebig and the words "Brand Baron Liebig," which was opposed by the Liebig's Extract of Meat Company. Mr. Justice Chitty held that it had already been decided that the term "Liebig's Extract of Meat" is common property, and that therefore the applicant was not entitled to register that part of the proposed trade mark which consisted of the words "Brand Baron Liebig." With respect to the portrait, he said it was a common custom to publish portraits of inventors and this portrait was not sufficiently distinctive for registration. Moreover, to suffer the registration to proceed would, in his opinion, be to sanction the registration of a mark calculated to mislead the public into the belief that Liebig's extract of meat was the property of the applicant. On these grounds the application was refused.

* * *

The Bill providing for the preparation of a new and legally authoritative United States Pharmacopœia by a committee consisting largely of State hospital officials, which has been introduced into the House of Representatives, is giving rise to a considerable amount of comment, which is not, as a rule, by any means favourable. The *Pharmaceutical Record* says that the whole movement has too much the colour of rivalry between New York and Philadelphia, apparently associating this rivalry especially with the change of publishers. "Some of the gentlemen of the latter city have never been able to disguise their dissatisfaction at the departure of the Pharmacopœia from them, and we do not believe a word of complaint against the scientific part of the present revision of the Pharmacopœia would have been sounded, had the business management been to the liking of the complainants."

It is announced that Sir Lyon Playfair, K.C.B., has consented to allow himself to be nominated at the Montreal meeting of the British Association as President for the meeting to be held in Aberdeen next year.

* * *

In the annual report of the Planters' Association of Ceylon it is stated that owing to the low prices now realized for cinchona bark, together with the liability of the cinchona tree to be short-lived in Ceylon, except in the most favourable localities, a general check has been given to its cultivation in the island. Cinchona is now giving place to tea, and it is thought that the exports, which are estimated to have last year reached six millions of pounds, will soon show a serious decline. The *Times of Ceylon*, too, commenting upon the same subject, says, "the flood is over and now we must expect the inevitable ebb."

* * *

The *Quinologist*, one of the numerous American technical journals, has been discontinued, to allow the editor (Dr. R. V. Mattison) to engage more actively in a business career which "the demands of an active constituency of customers and the exigencies of the situation in regard to the manufacture and sale of the alkaloids of the cinchona bark have rendered of the highest importance."

* * *

The *St. Louis Druggist* reports a case as having recently occurred in Watertown, N.Y., in which a physician, wishing to administer a dose of extract of valerian to a lady patient, went into a pharmacy and helped himself, with the result of administering extract of veratrum instead and nearly killing his patient.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, March 27, at 8 p.m., when a paper will be read by Mr. E. J. Eastes on "Unofficial Indigenous Materia Medica," and a Report upon Organic Chemistry will be made by the Secretary (Mr. Dunstan) on "Some Crystals found in a bottle of Aldehyde."

* * *

At the next meeting of the Chemists' Assistants' Association, to be held on Wednesday, the 26th inst., a paper on "Emulsions," will be read by Mr. Joseph Ince.

* * *

The next meeting of the Manchester Pharmaceutical Association will be held in the Medical Theatre, Owens College, on Tuesday evening, March 25, at 7.30 p.m., when the following papers will be read: "A Note on Kamala," by Mr. W. Kirkby, and "Notes on New Remedies," by Mr. F. C. J. Bird.

* * *

A forthcoming "Physic" course of "Gresham Lectures" is to be devoted to the Food Section of the International Health Exhibition of 1884, and will be given by Dr. E. Symes Thompson. The lectures will be delivered on Tuesday, the 25th inst., and three following days at 6 p.m. It may be convenient to mention that these endowed lectures are delivered in Gresham College, Basinghall Street, and are free to the public.

Provincial Transactions.

YORK CHEMISTS' ASSOCIATION.

On the 11th inst. Mr. H. E. Spencer, L.R.C.P., etc., delivered a very interesting lecture to the members of this Association, in the rooms of the York Young Men's Christian Association, upon the subject of "Disinfectants." Mr. J. Clark presided, and there was a fairly good attendance.

The lecturer remarked that the subject he had chosen was of a very practical character, and of great importance to both medical men and pharmacists. The questions for him to answer were, first, what disinfectants were expected to do; and, secondly, how they were expected to do it. After explaining the difference between a deodorizer and a disinfectant, he said he was inclined to adopt the germ theory of the present day. If it were taken for granted that that theory were true then their business would be to ascertain what would kill the bacteria—or the worst kind of germ—and they then would have obtained a true disinfectant. There was a large number of disinfectants which, for the sake of convenience, he classified as oxidizing agents, which destroyed infective matter by means of oxygen—nature's great purifier. There were also the desulphurating agents, the antiseptics, antizymotics, or to use another word the bactericides, and lastly the absorbents. Referring to the management of a sick room, he said the chief requirements were fresh air, light and cleanliness, and the use of disinfectants did harm if they caused persons to neglect the proper ventilation and cleansing of the sick room. Supposing that a person was suffering from typhoid fever, he showed how necessary it was that everything taken from the room should be thoroughly disinfected. Unless that were done the infection might be conveyed by means of the drain down to the nearest water-course, and thus communicated to persons who lived several miles off and drank the water. According to the germ theory, he said that it was easy enough to understand how, if an outbreak of typhoid fever took place at Boroughbridge, it could be communicated to the inhabitants of York in the water they drank, even after the water had passed through the water company's filter beds. In cases of scarlet fever, it was believed that the infection was in the dust or scales which came off the patient's skin when he was recovering, and it was, therefore, a very good plan to rub the patient's skin with a disinfectant.

Votes of thanks to the lecturer and the chairman concluded the proceedings.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

Mesmerism.

At the Friday Evening Meeting held at the Royal Institution on the 14th inst., Mr. J. N. Langley delivered a lecture on "Mesmerism." In opening the subject, the lecturer remarked that for centuries certain passes and movements had been known to exercise a mysterious influence over people. A great advance, however, was made by Mesmer, who wrote a treatise upon "The Theory of the Magnetic Fluid of the Body," whilst in Vienna in 1775, and soon afterwards obtained some notoriety in Paris. Some of Mesmer's researches were placed upon a scientific basis by the late Mr. Braid, of Manchester, who applied the term "Hypnotism" to the results which he obtained, thus making a distinction between the proved and unproved experiments of "Mesmerism." Before proceeding to the main part of his lecture, Mr. Langley gave a brief explanation of the physiological action produced when a stimulus is applied to the skin. He then went on to say that when rays of light from an object fall upon the retina, a nervous action is set up and passed on to the brain, giving an idea of the object from which the rays of light are reflected, and that this nervous action may be carried on to other parts and so cause reflex action, to maintain which does not necessarily require consciousness. The lecturer then drew attention to the fact that if any animal, for example a frog, be turned upon its back, and its early struggles gently and gradually repressed, it will be found after a few minutes to remain in a perfectly quiescent state, though recovering itself at a sudden flash of light, or a sharp noise, as well as upon the application of any cold substance. If allowed to remain in an undisturbed state, however, the frog falls into a deep torpor, in which it remains for a considerable length of time, the senses gradually becoming more incapable of noticing any stimulus as the length of time increases. Whilst in this stupor the limbs of the frog can be placed in any position, and will remain in that position for an indefinite period. If a slight pinch be administered, a corresponding movement of the muscle of the part is observed, and if a more vigorous pinch be given, muscular movement is noticed in all parts of the frog. If, however, two pinches in different parts be administered at the same time, no muscular action is generally apparent. Further, if the body of the frog be stroked, the frog emits one croak for each stroke it receives, but if a pinch be administered at the same time as the stroke, a croak is very seldom obtained. Mr. Langley then followed up his remarks by experimenting upon a frog, an alligator, and a pigeon, all of which he successfully mesmerized, casually mentioning that it is much harder and requires a longer period to obtain birds in the quiescent state. The lecturer then raised a question whether the animal, finding its first struggles for freedom futile, makes a resolve to lie quietly on its back and feign death, and as time goes on becomes more resolved to be unconscious to external influences, or whether the torpor arises from a paralysis of the will. Mr. Langley favoured the latter view, stating that he considered the mesmeric condition to be due to the non-activity of certain nerve centres in the brain. At the close of the lecture an excellent description was given of the method adopted to mesmerize a human being. A bright object is held in the left hand of the operator, about eight to ten inches from the eyes of the subject, who is directed to rivet his attention upon the object, and if at any time his gaze is diverted, the experiment has to be recommenced. At first the pupils of the eye will contract, but afterwards gradually dilate, and when in that state, if the operator carry his right hand from the object towards the eyes, the eyelids will generally close with a vibratory motion. In a few seconds the subject can be compelled to perform any action, if the proper stimulus be applied. After quoting some instances of unconscious mesmerism, Mr. Langley remarked that if a person be told that he will be mesmerized at a certain time, that person, if he thought of the assertion at the appointed time, might mesmerize himself as a consequence.

The following is the text of the important lecture on a Mechanical Theory of Magnetism delivered by Professor Hughes, on the 29th ult.:—

Theory of Magnetism.

BY PROFESSOR D. E. HUGHES, F.R.S., M.R.I.

The theory of magnetism, which I propose demonstrating this evening, may be termed the mechanical theory of magnetism, and, like the now well-established mechanical theory of heat, replaces the assumed magnetic fluids and elementary electric currents by a simple, symmetrical, mechanical motion of the molecules of matter and ether.

That magnetism is of a molecular nature has long been accepted, for it is evident that, no matter how much we divide a magnet, we still have its two poles in each separate portion, consequently we can easily imagine this

division carried so far that we should at last arrive at the molecule itself possessing its two distinctive poles, consequently all theories of magnetism attempt some explanation of the cause of this molecular polarity, and the reason for apparent neutrality in a mass of iron.

Coulomb and Poisson assume that each molecule is a sphere containing two distinct magnetic fluids, which in the state of neutrality are mixed together, but when polarized are separated from each other at opposite sides; and, in order to explain why these fluids are kept apart as in a permanent magnet, they had to assume, again, that each molecule contained a peculiar coercive force, whose functions were to prevent any change or mixing of these fluids when separated.

There is not one experimental evidence to prove the truth of this assumption; and as regards coercive force, we have direct experimental proof opposing this view, as we know that molecular rigidity or hardness, as in tempered steel, and molecular freedom or softness, as in soft iron, fulfil all the conditions of this assumed coercive force.

Ampère's theory, based upon the analogy of electric currents, supposes elementary currents flowing around each molecule, and that in the neutral state these molecules are arranged hap-hazard in all directions, but that magnetization consists in arranging them symmetrically.

The objections to Ampère's theory are numerous. 1st. We have no knowledge or experimental proof of any elementary electric currents continually flowing without any expenditure of energy. 2nd. If we admit the assumption of electric currents around each molecule, the molecule itself would then be electro-magnetic, and the question still remains, What is polarity? Have the supposed electric currents separated the two assumed magnetic fluids contained in the molecule, as in Poisson's theory? or are the electric currents themselves magnetic, independent of the iron molecule?

In order to produce the supposed heterogeneous arrangement of neutrality, Ampère's currents would have either to change their position upon the molecule, and have no fixed axis of rotation, or else the molecule, with its currents and polarities, would rotate, and thus be acting in accordance with the theory of De la Rive. 3rd. This theory does not explain why (as in the case of soft iron) polarity should disappear whenever the exciting cause is removed, as in the case of transient magnetization. It would thus require a coercive force in iron to cause exactly one-half of the molecules to instantly reverse their direction, in order to pass from apparent external polarity to that of neutrality.

The influence of mechanical vibrations and stress upon iron in facilitating or discharging its magnetism, as proved by Matteucci, 1847, in addition to the discovery by Page, 1837, of a molecular movement taking place in iron during its magnetization, producing audible sounds, and the discovery by Dr. Joule, 1842, of the elongation of iron when magnetized, followed by the discoveries of Guillemin, that an iron bar bent by a weight at its extremity would become straight when magnetized; also that magnetism would tend to take off twists or mechanical strains of all kinds—together with the researches of Matteucci, Marianini, De la Rive, Sir W. Grove, Faraday, Weber, Wiedemann, Du Moncel, and a host of experimenters, including numerous published researches by myself—all tend to show that a mechanical action takes place whenever a bar of iron is magnetized, and that the combined researches demonstrate that the movement is that of molecular rotation.

De la Rive was the first to perceive this, and his theory, like those of Weber, Wiedemann, Maxwell and others, is based upon molecular rotation. Their theories, however, were made upon insufficient data, and have proved to be wrong as to the assumed state of neutrality, and right only where the experimental data clearly demonstrated rotation.

I believe that a true theory of magnetism should admit of complete demonstration, that it should present no anomalies, and that all the known effects should at once be explained by it.

From numerous researches I have gradually formed a theory of magnetism entirely based upon experimental results, and these have led me to the following conclusions:—

1. That each molecule of a piece of iron, as well as the atoms of all matter, solid, liquid, gaseous, and the ether itself, is a separate and indcpendent magnet, having its two poles and distribution of magnetic polarity exactly the same as its total evident magnetism when noticed upon a steel bar-magnet.

2. That each molecule, or its polarity, can be rotated in either direction upon its axis by torsion, stress, or by physical forces such as magnetism and electricity.

3. That the inherent polarity or magnetism of each molecule is a constant quantity like gravity; that it can neither be augmented nor destroyed.

4. That when we have external neutrality, or no apparent magnetism, the molecules or their polarities arrange themselves so as to satisfy their mutual attraction by the shortest path, and thus form a complete closed circuit of attraction.

5. That when magnetism becomes evident, the molecules or their polarities have all rotated symmetrically, producing a north pole if rotated in a given direction, or a south pole if rotated in the opposite direction. Also, that in evident magnetism we have still a symmetrical arrangement, but one whose circles of attraction are not completed except through an external armature joining both poles.

6. That we have permanent magnetism when the molecular rigidity, as in tempered steel, retains them in a given direction, and transient magnetism whenever the molecules rotate in comparative freedom, as in soft iron.

Experimental Evidences.

In the above theory the coercive force of Poisson is replaced by molecular rigidity and freedom; and as the effect of mechanical vibrations, torsion, and stress upon the apparent destruction and facilitation of magnetism is well known, I will, before demonstrating the more serious parts of the theory, make a few experiments to prove that molecular regidity fulfils all the requirements of an assumed coercive force.

I will now show you that if I magnetize a soft iron rod, the slightest mechanical vibration reduces it to zero; whilst in tempered steel or hard iron, the molecules are comparatively rigid, and are but slightly affected. The numerous experimental evidences which I shall show prove that whilst the molecules are not completely rigid in steel, they are comparatively rigid when compared with the extraordinary molecular freedom shown in soft iron. (*Experiments shown.*)

If I now take a bottle of iron filings, I am enabled to show how completely rigid they appear if not shaken; but the slightest motion allows these filings to rotate and short circuit themselves, thus producing apparent neutrality. Now I will restore the lost magnetism by letting the filings slowly fall on each other under the influence of the earth s magnetic force; and here we have an evident proof of rotation producing the result, as we can ourselves perceive the arrangement of the filings. (*Experiment shown.*)

If I take this extremely soft bar of iron, you notice that the slightest mechanical tremor allows molecular rotation, and consequent loss or change of polarity; but if I put a slight strain on this bar, so as to fasten each molecule, they cannot turn with the same freedom as before, and they now retain their symmetrical polarity like tempered steel, even when violently hammered. (*Experiment shown.*)

We can only arrive at one conclusion from the experiment, viz., that the retention of apparent magnetism is simply due to a frictional resistance to rotation; and

whenever this frictional resistance is reduced, as when we take off a mechanical strain, or by making the bar red hot, the molecules then rotate with an almost inconceivable freedom from frictional resistance.

Conduction.

You notice that if I place this small magnet at several inches' distance from the needle, it turns in accordance with the pole presented. How is the influence transmitted from the magnet to the needle? It is through the atmosphere and the ether, which is the intervening medium. I have made a long series of researches on the subject, involving new experimental methods, the results of which are not yet published. One result, however, I may mention. We know that iron cannot be magnetized beyond a certain maximum, which we call its saturation point. It has a well-defined curve of rise to saturation, agreeing completely with a curve of force produced by the rotation of a bar magnet, the force of which was observed from a fixed point. I have completely demonstrated by means of my magnetic balance (*shown in the Library*) that our atmosphere, as well as Crookes' vacuum, has its saturating point exactly similar in every respect to that of iron: it has the same form through every degree. We cannot reduce nor augment the saturating point of ether; it is invariable, and equals the finest iron. We may, however, easily reduce that of iron by introducing frictional resistance to the free motion of its molecules.

From consideration of the ether having its saturating point, I am forced to the conclusion that it could only be explained by a similar rotation of its atoms as demonstrable in iron.

Reflection would teach us that there cannot be two laws of magnetism, such as one of vibrations in the ether and rotations in iron. We cannot have two correct theories of heat, light, or magnetism; the mode of motion in the case of magnetism being rotation, and not vibration.

Let us observe this saturation point of ether compared with iron. I pass a strong current of electricity in this coil. The coil is quite hot, so we are very near its saturation. I now place this coil at a certain distance from the needle (8 inches); we have now a deflection of 45° on the needle. I now introduce this iron core, exactly fitting the interior previously filled by the ether and atmosphere. Its force is much greater, so I gradually remove this coil to a distance, where I find the same deflection as before (45°). This happens to be at twice the distance, or 16 inches, so we know, according to the law of inverse squares, that the iron has four times the magnetic power of the ether. But this is only true for this piece of iron: with extremely fine specimens of iron I have been enabled to increase the force of the coil forty times, whilst with manganese steel containing 10 per cent. of manganese it was only 30 per cent. superior. We see here that the atmosphere is extremely magnetic. Let us replace the solid bar by iron filings. We now only have twice the force of ether. Replace this by a bottle of sulphate of iron in a liquid state: it is now a mere fraction superior to the atmosphere; and if we were still further to separate the iron molecules, as in a gaseous state, it is reasonable to suppose that if we could isolate the iron gas from that of ether, that iron gas would be strongly diamagnetic, or have far less magnetic capacity than ether, owing to the great separation of its molecules. These are assumptions, but they are based upon experimental evidences, which give it value.

Let us quit the domain of assumption to enter that of demonstration. Here I have a long bar of neutral iron. If I place this small magnet at one end, we notice that its pole has moved forward three inches, having a consequent point at that place. Let us now vibrate this rod and you notice the slow but gradual creeping of the conduction until at the end of two seconds it has reached 14 inches. The molecules have been freed from frictional resistance by the mechanical vibrations, and have at once rotated all along the bar. (*Experiment shown.*) Let us repeat this experiment by heating the rod to red heat. You notice the gradual creeping or increased conduction as the heat allows greater molecular freedom. (*Experiment shown.*) Let us now again repeat this experiment by sending a current of electricity through the bar. You notice the instant that I touch the bar with this wire, conveying the current through it, that we have identically the same creeping forwards, no matter what direction of the current. (*Experiment shown.*) If you simply looked at the effects produced, you could not tell which method I had employed; either mechanical vibrations, heat vibrations, or electrical currents. Consequently, knowing the two first to be modes of motion, it is fair to assume that an electrical current is a mode of motion, the manner of which is at present unknown; but that there is a molecular disturbance in each case is evident from the experiments shown.

Neutrality.

If I take this bar of soft iron, introduce it in the coil, and pass a strong electric current through the coil, you notice that it is intensely magnetic, holding up this large armature of iron and strongly deflecting the observing needle. I now interrupt the current, the armature falls, and the needle only shows traces of the previous intense magnetization. What has become of this polarity? or what has caused this sudden neutrality? Coulomb supposes that the magnetic fluids have become mixed in each molecule, thus neutralizing each other. Ampère supposes that the elementary currents surrounding each molecule have become heterogeneous. De la Rive, Wiedemann, Weber, Maxwell, and all up to the present time have accounted for this disappearance as a case of mixture of polarities or heterogeneous arrangement.

My researches proved to me that neutrality was a symmetrical arrangement; I stated this in my paper upon the theory of magnetism to the Royal Society last year. I have since made a long series of researches upon this question, and my paper upon this subject will shortly be read at the Royal Society. This paper will demonstrate beyond question—1. That a bar of iron under the influence of a current or other magnetizing force is more strongly polarized on the outside than in the interior; that its degree of penetration follows the well-defined law of inverse squares, up to the saturation point of each successive layer. 2. The instant that the current ceases, a reaction takes place, the stronger outside reacting upon the weaker inside, completely reversing it, until its reversed polarity exactly balances the external layers.

We might here suppose that there existed two distinct polarities at the same end of a neutral bar, but this is only partially true, as the rotation of the molecules from the inside to the exterior is a gradual, well-defined curve, perfectly marked, as shown in the diagrams. (*Diagrams explained.*) We see from these that in a large solid bar the reversed polarity would be in the interior, but in a thin bar under an intense field the reversed polarity would be on the outside. Thus a bar which had previously strong north polarity under an external influence would, the instant it formed its neutrality, have a north polarity in the interior covered or rendered neutral by an equal south exterior, the sum of both giving the apparent neutrality that we notice. I must refer all interested upon this question to my paper shortly to be read, but I will make a few experiments to demonstrate this important fact.

If I take this piece of soft steel and magnetize it strongly, it has a strong remaining magnetism, or only partial neutrality. If I now heat this steel to redness, or put it into a state of mechanical vibration, the remaining magnetism almost entirely disappears, and we have apparent neutrality. This piece of steel being thin ($\frac{1}{2}$ millimetre), I know that the outside is reversed to its

previous state. I place this piece of steel in a glass vase near the observing needle, and at present there seems no polarity. I now pour dilute nitric acid upon it, filling up the vase. The exterior is now being dissolved, and in a few minutes you will see a strong polarity in the steel, as the exterior reversed polarity is dissolved in the acid. (*Experiment shown.*)

Let us observe this by a different method. I take two strips of hard iron, and magnetize them both in the same direction.

If I place them together and then separate them, there seems no change, although in reality the mere contact produced a commencement of reversal. Let us vibrate them whilst together, allowing the molecules greater freedom to act as they feel inclined; and now on separating we see that one strip has exactly the opposite polarity to the other, both extremely strong, but the sum of which when placed together, is zero or neutrality. (*Experiment shown.*)

Let us take two extremely soft strips placed together, and magnetized whilst together. On withdrawal of the inducing force, the rods are quite neutral. (*Experiment shown*).

We now separate these strips, and find that one is violently polarized in one direction, whilst the other is equally strong in the reversed; the sum of both being again zero.

We might suppose that the reaction is due to having separate bars. I will now demonstrate that this is not the case by magnetizing this large ¾-inch bar with a magnetizing force just sufficient to render the rod completely neutral when held vertically or under the earth's magnetic influence. (*Experiment shown.*)

You notice that it is absolutely neutral, all parts as well as the ends showing not the slightest trace of polarization. I reverse this bar, and you perceive that it is now intensely polarized. This is due to the fact that the earth's influence uncovers or reverses the outside molecules, and consequently they are now of the same polarity as its interior. Upon reversing this rod, the magnetism again disappears, and reappears if turned as previously. We have thus a rod which appears intensely magnetic when one of its ends is lowermost, whilst if that same end is turned upwards all traces of magnetism disappear.

These and several other demonstrations which I shall now show you (proving the enormous influence which thickness of a bar has in the production of neutrality or its retention of magnetism) are simple lecture demonstrations. For the complete proof of my discovery of neutral curves I must refer you to my forthcoming paper upon this subject. (*Experiments shown proving the great influence of a thickness of a bar upon its retentive and neutral powers.*)

Inertia.

I have remarked in my researches that the molecules have true inertia, that they resist being put in motion, and if put in motion will vanquish an opposing resistance by their simple momentum. To illustrate this, I take this large ¾-inch bar, magnetize it so that its south pole is at the lowest end. We know that the earth's influence is to make the lower end north. I now gently strike it with a wooden mallet, and the rod immediately falls to zero. I continue these blows, but the rod obstinately refuses to pass the neutral line to become north, the reason being in so doing it would have to change the whole internal reversed curve that I have discovered. It requires now extremely violent and repeated blows from the mallet to make it obey the earth's influence.

Let us repeat this experiment by starting the molecule rapidly in the first instance. The rod is now magnetized south as before. I give one single sharp tap; the molecules run rapidly round, pass through neutrality, breaking up its curve, and arrive at once to strong north polarity. (*Experiment shown.*)

A very extraordinary effect is shown if we produce this effect by electricity; it then almost appears as if electricity itself had inertia. I take this bar of hard iron and magnetize it to a fixed degree. On the passage of the current, you notice that the magnetism seems to be increased as the needle increases its arc, but this is caused by the deflection of the electric current in the bar. The current is now obliged to travel in spirals, as my researches have proved to me that electricity can only travel at right angles to the magnetic polar direction of a molecule, consequently in all permanent magnets the current must pass at right angles to the molecule and its path will be that of a spiral. Let us replace this bar by one from a similar kind of iron well annealed. The molecules here are in a great state of freedom. We now magnetize this rod to the same degree as in the previous case; the electric current now, instead of being deflected, completely rotates the molecules, and the needle returns to zero, all traces of external magnetism having ceased. The electricity on entering this bar should have been forced to follow a tortuous circular route, its momentum was, however, too great for the molecules, and they elected to turn, allowing the electricity to pass in a straight line through the bar. Thus, in the first instant, magnetism was the master directing the course of the current; in the last, it became its servant, obeying by turning itself to allow a straight path to its electric master. (*Experiment shown.*)

Superposed Magnetism.

It is well known that we can superpose a weak contrary polarity upon an internal one of an opposite name. I have been enabled thus to superpose twenty successive stratas of opposite polarities upon a single rod, by simply diminishing the force at each reversal. I was anxious to prepare a steel wire so that in its ordinary state it would be neutral, but that in giving it a torsion to the right one polarity would appear, whilst a torsion to the left would produce the opposite polarity. This I have accomplished by taking ordinary soft steel drill wire and magnetizing it strongly whilst under a torsion to the right, and more feebly with an opposite polarity when magnetized under torsion to the left.

The power of these wires, if properly prepared, is most remarkable, being able to reverse their polarity under torsion, as if they were completely saturated; and they preserve this power indefinitely if not touched by a magnet. It would be extremely difficult to explain the action of the rotative effects obtained in these wires under any other theory than that which I have advanced; and the absolute external neutrality that we obtain in them when the polarities are changing we know, from their structure, to be perfectly symmetrical.

I was anxious to show some mechanical movement produced by molecular rotation, consequently I have arranged two bells that are struck alternately by a polarized armature put in motion by the double polarized rod I have already described, but whose position, at 3 centimetres distant from the axis of the armature, remains invariably the same. The magnetic armature consists of a horizontal light steel bar suspended by its central axle; the bells are thin wineglasses, giving a clear musical tone loud enough, by the force with which they are struck, to be clearly heard at some distance. The armature does not strike these alternately by a pendulous movement, as we may easily strike only one continuously, the friction and inertia of the armature causing its movements to be perfectly dead-beat when not driven by some external force, and it is kept in its zero position by a strong directive magnet placed beneath its axle.

The mechanical power obtained is extremely evident, and is sufficient to put the sluggish armature in rapid motion, striking the bells six times per second, and with a power sufficient to produce tones loud enough to be clearly heard in all parts of the hall of the Institution.

There is nothing remarkable in the bells themselves, as they evidently could be rung if the armature was surrounded by a coil, and worked by an electric current from a few cells. The marvel, however, is in the small steel superposed magnetic wire producing by slight elastic torsions from a single wire, 1 millimetre in diameter, sufficient force from mere molecular rotation to entirely replace the coil and electric current. (*Experiment shown by ringing the bells by the torsion of a small $\frac{1}{15}$ inch wire placed 4 inches distant from bell-hammer.*)

Correlation of Forces.

There is at present a tendency to trace all physical forces to one, or rather a variation of modes of motion. In my last experiment the energy of my arm was transformed in the wire to molecular motion, producing evident polarity; this, again, acted upon the ether, putting the needle-hammer into mechanical motion. This by its impact upon the glass bells transformed its motions into sonorous vibration; but this does not mean that we can convert directly sonorous vibrations into magnetism, or *vice versâ*.

Let us take this soft iron rod; it seems quite neutral, although we know that the earth's magnetism is trying to rotate its molecules to north polarity at its lowest extremity. We now put it in mechanical vibration by striking it gently with a wooden mallet; the molecules at once rotate, and we have the expected strong north polarity. Let us repeat this experiment by employing heat, and here, again, at red heat an equally strong north polarity appears.

Again we repeat, and simply pass an electric current of no matter what direction; again the same north pole appears. Thus these forces must be very similar in nature, and may be fairly presumed to be vibrations, or modes of motion, having no directive tendency except a slight one, as in the case of electricity. For the same three forces render the rod perfectly neutral, even when previously magnetized, when placed in a longitudinally neutral field, as east and west.

Motion of the molecules gives rise to external magnetism to a rod previously neutral, or renders it neutral when previously magnetized; in other words, it simply allows the molecules to obey an external directing influence; the only motion, therefore, is during a change of state or polarity. If there is constant polarity, there is no consequent motion of the molecules: in fact, the less motion of any kind that it can receive, the more perfect its retention of its previous position; consequently, constant magnetism cannot be looked upon as a mode of motion, neither vibratory nor rotatory; it is an inherent quality of each molecule, similar in its action to its chemical affinity, cohesion, or its polar power of crystallization. A molecule of all kinds of matter has numerous endowed qualities; they are inherent, and special in degree to the molecule itself. I regard the magnetic endowed qualities of all matter or ether to be inherent, and that they are rendered evident by rotation to a symmetrical arrangement in which their complete polar attractions are not satisfied.

Time will not allow me to show how completely this view explains all the phenomena of electro-magnetism, diamagnetism, earth currents—in fact, all the known effects of magnetism—up to the original cause of the direction of the molecules of the earth. To explain the first cause of the direction of the molecules of the earth would rest altogether upon assumption as the first cause of the earth's rotation, and of all things down to the inherent qualities of the molecule itself.

The mechanical theory of magnetism which I have advocated seems to me as fairly demonstrable as the mechanical theory of heat, and it gives me great pleasure to have been allowed to present you with my views on the theory of magnetism.

SOCIETY OF ARTS.

Alloys used for Coinage.

The first of what promises to be an interesting course of four Cantor lectures by Professor W. Chandler Roberts, Chemist of the Royal Mint, upon the "Alloys used for Coinage," was delivered on Monday, the 17th inst., at the Society of Arts. This lecture was principally confined to noticing the gradual development of the process of coining, the subject of the composition of the coins in ancient and modern times also being slightly touched upon. Although barter generally answered for the purpose of obtaining the necessaries of life, it is evident that when a higher stage of civilization was attained it was necessary that some recognized medium of exchange should be determined upon. The Chinese manufactured coins of the shape of the equivalent article of commerce, the lecturer showing an engraving of a coin representing a shirt. At first the currency was not confined to any particular object, stone and bronze implements being used amongst other things, and none of them possessing any stamp authoritatively indicating their real value. Circular masses of metal were then used, until the Greeks, who were the first to strike their coins, in the 7th century, B.C., introduced a semi-spherical form, on one side of which a head or some figure was impressed, by means of a soft iron or bronze die, whilst the reverse only bore signs of the nail-head, used to keep the metal in position whilst it was being struck. The engraving rapidly improved, and the lecturer considered that some of the coins he exhibited might be classed amongst high works of art. The Romans cast a great number of their coins, using moulds of sand for the operation; an ingenious method was also used for casting by the Chinese and Japanese, the metal being run into long narrow bags of wired wet canvass, ingots being formed from which they manufactured their blanks. In 1515 Leonardo da Vinci introduced an improved form of cutter and die, which ensured coins equal in point of size; the coins, as stamped from the sheets of metal, passed up inside the cutter, whilst in the die process, the coin was encircled by a metal ring to prevent the flattening consequent from the blows of the hammer. A similar form was used until a few years ago in the Scotch mint, the cutter being solid and fitting loosely into a hollow anvil; this was also the origin of the monkey die. In 1540 Benvenuto Cellini invented the screw-press, which gradually superseded the use of the hammer. Professor Roberts considered that it would be wasting time to give a full description of the methods of coinage used in the Royal Mint at the present time, as a very complete one is given in the new edition of the 'Encyclopædia Britannica,' and notices of all new machines are given in his official annular reports; he therefore only glanced at the chief points for ensuring the accuracy of the composition of the coins. The ingots are first carefully assayed and brought up to the required standard and then made into the form of bars. These bars are rolled out between chilled iron rollers into thin layers, out of which disks are cut, and these disks are again assayed. It is found necessary to "pickle" the blanks in sulphuric acid to remove the superficial layer of base metal. It is generally known that pure gold and silver is not used for coinage, but it is not so widely known that the amount of base metal in the alloys is guarded by most rigorous laws; it will be seen how necessary this is, when it is known that there are between seven and eight hundred tons of alloy of gold and copper in circulation at the present time. It is also important that money should be made of some metal not too common. At the close of the lecture, Professor Roberts remarked upon the relation of the mechanism employed in coinage in regard to scientific progress; at times the mechanism was far behind and at other times far in advance of the progress of science. Steel dies were not used until A.D. 300, whilst nearly all the work was done by hand till 1662. Rollers were known long before their introduction into mints,

but now sheets could be rolled with such accuracy as to be reckoned to the $\frac{1}{2000}$th part of an inch. Milling until 1882 had been performed by means of a split collar, but improvements had now been made in that operation.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, March 13, Mr. H. G. Greenish, Vice-President, in the chair. Mr. T. S. Dymond read some—

Notes on the Synthesis of Uric Acid.

BY T. S. DYMOND.

The synthesis of uric acid having been effected by Herr Horbaczewski, and his report on the work published in the *Berichte der deutschen chemischen Gesellschaft*, November, 1882, I attempted to confirm his experiments and brought the results of part of my work before this Association last year. Having now completed my work on the subject, I venture to bring the matter before you again.

The production of uric acid by synthesis is very important, because its composition has long been a point of dispute, and this discovery will aid in finding its true chemical constitution, and when this is once determined, we shall be better able to understand its occurrence in the animal economy, and to regulate its formation in the animal tissues in complaints brought on by the deposition of its compounds.

The synthesis of urea, another important constituent of urine, was accomplished more than seventy years ago from ammonium cyanate, but uric acid has never before been obtained by synthesis. Uric acid occurs in the excrements or tissues of carnivorous animals only, though at the same time it has been found that, in the case of human beings, a vegetarian diet makes but little difference in the quantity of uric acid produced, and has even been noticed to increase it.

It occurs very largely in serpents' dung and guano as the ammonium salt, and in small quantities in human urine chiefly as the sodium salt. Occasionally a deposition of the more insoluble urates or uric acid takes place within the bladder, producing a variety of urinary calculus, or as the sodium salt within the muscles, producing gout. It is the product of the proteid tissues, and is derived from the nitrogenous elements of the food. Chiefly produced in the liver it is taken up by the blood, passed through the body, filtered out by the kidneys, and carried away by the urine.

The following is the method by which Herr Horbaczewski effected the synthesis of uric acid:—

One part of pure glycocine was mixed with 10 parts of urea, and the mixture was heated in a metal bath at 200°—230° C., till the fused mass, at first clear and colourless, had become golden brown and thick. When cold this was dissolved in dilute potash, and the solution supersaturated with ammonium chloride. Ammoniacal solutions of silver and magnesia were then added and the liquid was filtered. The precipitate was well washed with solution of ammonia, and decomposed with solution of sulphide of potassium, and again filtered. The filtrate was saturated with hydrochloric acid and the whole concentrated, when the impure uric acid separated out, and was purified by twice repeating the process, and finally, by washing with alcohol, ether and carbon bisulphide. The substance thus obtained was identified as uric acid by its crystalline form, by the action on copper and silver solutions, by the murexide test, and by its insolubility in water, alcohol, and ether.

In order to confirm this experiment I tried it myself, but at first failed, apparently because equal parts of urea and glycocine were used. Having since used 10 parts of urea to 1 of glycocine I have been more successful. The following are a few notes on my work:—

Glycocine may be obtained by three methods:—

I. By the action of either sulphuric acid or potash on gelatine. By this method amido-caproic acid (leucine) and amido-acetic acid (glycocine) are formed thus—

$$C_6H_{10}N_2O_2 = \begin{cases} C_5H_{10}.NH_2 \\ CO.OH \end{cases} + \begin{cases} CH_2.NH_2 \\ CO.OH \end{cases} + xNH_3, \text{ etc.}$$

The glycocine being insoluble in alcohol is thus separated from the leucine, which is soluble. Having some of that prepared by this method, I purified it from the leucine with which it was still contaminated, by washing with absolute alcohol, and then, by a long series of recrystallizations from water purified it from the colouring matter and obtained this pure specimen.

II. By the action of ammonia on bromacetic acid, a method only interesting scientifically, as it shows what might be the constitution of glycocine:—

$$\begin{cases} CH_2.Br \\ CO.OH \end{cases} + 2NH_3 = NH_4Br + \begin{cases} CH_2.NH_2 \\ CO.OH \end{cases}$$

III. By the action of hydrochloric acid on hippuric acid, an important constituent of cattle urine. I have also prepared glycocine by this method. The hippuric acid was boiled with strong hydrochloric acid, dark oily drops of benzoic acid being formed as the hippuric acid disappeared. After diluting and cooling, the benzoic acid was filtered off, and the solution containing hydrochlorate of glycocine was evaporated until most of the free acid was expelled, and then neutralized by ammonia and precipitated by absolute alcohol. The glycocine was freed from the ammonium chloride by washing with more absolute alcohol, and finally crystallized from water. The reaction is as follows:—

$$\begin{cases} CH_2.NH(C_6H_5.CO) \\ CO.OH \end{cases} + \begin{cases} H \\ HO \end{cases} = \begin{cases} CH_2.NH_2 \\ CO.OH \end{cases} + \begin{cases} C_6H_5 \\ CO.OH \end{cases}$$

Glycocine in many respects resembles sugar; its taste is very sweet, and it is also difficult to decolorize by crystallization alone; it is hence called sugar of gelatine, but it more readily crystallizes than sugar, being not so soluble in water. It is distinguished from cane sugar but resembles grape sugar by the reduction of copper solutions and in other ways. I found that it is distinguished from grape sugar by not giving the borax reaction, as it has been shown by Mr. Dunstan many of the polyhydric alcohols do. This indeed is what one would expect, as glycocine has not the constitution of an alcohol. Glycocine may be represented as acetic acid where one atom of hydrogen of the methyl group has been replaced by amidogen; or it may be perhaps acetic acid where one atom of the acid group oxatyl has been replaced by amidogen— $\begin{cases} CH_3 \\ CO.ONH_2, \end{cases}$ for it appears to be not a true acid, as it has a sweet taste, no reaction on litmus paper, and crystallizes from alcohol, in the presence of ammonia.

Urea occurs in most urine, in human blood and in many animal secretions, and is prepared either by the exhaustion of evaporated urine with alcohol, or better by the action of sulphate of ammonium on a solution of cyanate of potassium. Cyanate of ammonium is found in solution, which on boiling with water yields the isomeric body urea. Urea may also be produced by the action of heat on carbonate of ammonium, one of the constituents of commercial ammonium carbonate. Cyanate of ammonium is first formed and this is changed into urea.

$$NH_4NH_2CO_2 = H_2O + NH_4CNO = (NH_2)_2CO$$

or $H-N-H$ $\quad$ N $\quad$ O $\quad /NH_2$

$\quad\quad |\quad\quad\quad\quad |\!|\quad\quad\quad\quad ||\quad\quad$

$\quad CO.ONH_4\quad\quad C-O-NH_4\quad\quad C-NH_2.$

Urea is, then, diamide of carbonyl or carbamide.

With these two substances, urea and glycocine, I have made the following experiment:—1 drachm of glycocine was mixed with 10 of urea and heated in a beaker by an oil bath to a temperature of 230° C. The mass soon liquefied and a copious evolution of ammonia together with a gradual darkening in colour followed. When the evolution of gas lessened the beaker was removed and allowed to cool. The hard residue was dissolved in potash and the solution decolorized with animal charcoal (a great improvement on the process of purification proposed by Horbaczewski, who had laboriously gone over

the entire process of separation again and again, till the residue had become colourless, and I had found by previous experiment on pure uric acid that the uric acid was not lost or changed in any way by the process). On evaporating a portion to dryness and heating with nitric acid and adding ammonia, purple murexide was obtained, and the synthesis of uric acid confirmed.

Now came the question of how to isolate the uric acid, and this I found a very difficult matter.

The rationale of Horbaczewski's method is this. The urates and cyanurates of potassium are precipitated as ammonium, magnesium and silver salts. These are decomposed with potassium sulphide, the silver being thus thrown out. The uric and cyanuric acids are precipitated by acid and any sulphur thrown out is dissolved away by bisulphide of carbon. The cyanuric acid is then separated by alcohol and ether and the uric acid remains pure.

Horbaczewski's method does not work well, because in the presence of other matters ammonium chloride and ammonio magnesium and silver solutions do not readily precipitate uric acid, and because the separation of uric acid from cyanuric is not readily effected by alcohol, uric acid, I find, being slightly soluble in even absolute alcohol, and more so in the presence of cyanuric acid.

The methods attempted for effecting this separation were the following:—

To the decolorized solution in potash of the mass obtained as above ammonium chloride was added and the precipitate filtered off. The more insoluble salts were separated from the solution by three successive crystallizations, and the mother liquor, which gave the murexide very clearly, was evaporated to dryness, dissolved in sulphuric acid and precipitated by water, this being a good way of obtaining uric acid in a crystalline form. The resulting crystals were, however, found to be chiefly cyanuric acid, mixed with a few crystals of uric acid, and as the three crops of crystals I had obtained before contained much uric acid, this method of isolating uric acid by crystallization was unsuccessful. Some of these crystals were dissolved in boiling water and evaporated just to dryness with hydrochloric acid. The residue, which contained uric acid, was boiled with successive portions of absolute alcohol. Nearly the whole dissolved, but on testing residue and solution, neither contained any uric acid, showing that it was impossible thus to separate the two acids. Some more of the crystals, which contained uric acid, were dissolved in water; ammonio-sulphate of magnesium and ammonio-chloride of silver were added. The precipitate was filtered off and decomposed with solution of sulphide of potassium. The sulphide of silver was filtered off and the solution acidified with hydrochloric acid and allowed to crystallize. The residue, however, after the removal of the sulphur with CS_2, was found to contain no uric acid, thus showing that silver and magnesia, though precipitating uric acid when present in considerable quantity, will not do so when in small quantities and when salts of other acids largely preponderate.

I have, then, been unsuccessful in materially improving upon Horbaczewski's method for the isolation of uric acid when obtained from glycocine and urea, except in the one point of decolorization of the impure urate solution by animal charcoal.

Turning to the question of the constitution of uric acid, this reaction does not, unfortunately, settle the point. The reaction, indeed, might be represented simply thus—

$$\left\{\begin{matrix}CH_2.NH_2\\CO.OH\end{matrix}\right. + 3\,CO\begin{matrix}\diagup NH_2\\\diagdown NH_2\end{matrix} = \left\{\begin{matrix}CH_3NH(C_3N_3O)\\CO.OH\end{matrix}\right. + 3NH_3 + 2H_2O$$

and uric acid would be glycocine in which a cyanuric acid residue has been inserted, just as hippuric acid is glycocine in which a benzoic acid residue has been inserted:

$$\left\{\begin{matrix}CH_2.NH(C_3N_3O)\\CO.OH\end{matrix}\right. \qquad \left\{\begin{matrix}CH_2.NH(C_6H_5.CO)\\CO.OH\end{matrix}\right.$$

And this seems to be possible, for uric acid when heated with hydriodic acid yields glycocine, carbonic acid and ammonia.

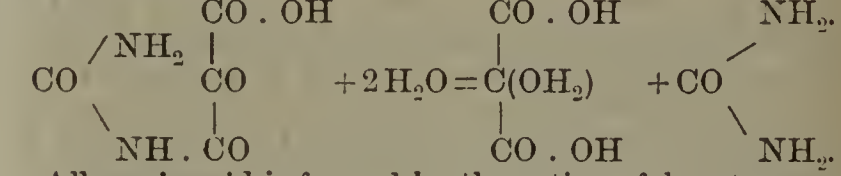
$$C_5H_4N_4O_3 + 5H_2O = \left\{\begin{matrix}CH_2.NH_2\\COOH\end{matrix}\right. + 3\,CO_2 + 3\,NH_3$$

the carbonic acid and ammonia representing exactly one molecule of cyanuric acid with three of water.

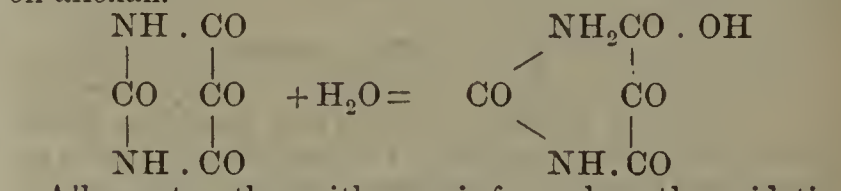
$$3\,CO_2 + 3NH_3 = H_3C_3N_3O_3 + 3\,H_2O.$$

If uric acid consisted, however, simply of the residues of cyanuric acid and glycocine, we should expect to be able to form it directly from these two substances when brought into intimate contact by solution in inactive substances, such as phosphoric acid, chloride of zinc or glycerine; this I have not been able to do, but the fact of the cyanuric acid not being nascent may account for this.

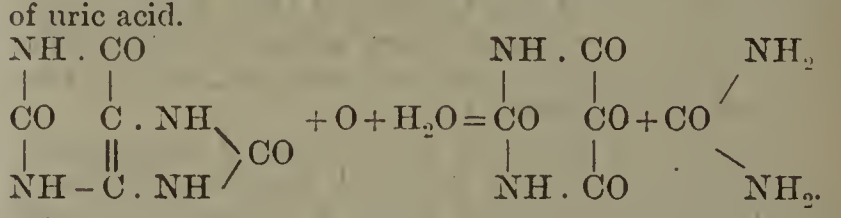
This formula also will not at all explain many of the decompositions of uric acid. There are a series of derivatives of uric acid which seem to throw more light on its constitution. A body called mesoxalic acid is formed together with urea by the action of baryta water on alloxanic acid—



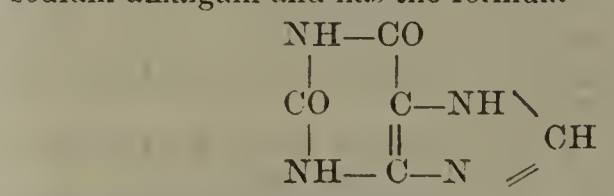
Alloxanic acid is formed by the action of baryta water on alloxan.



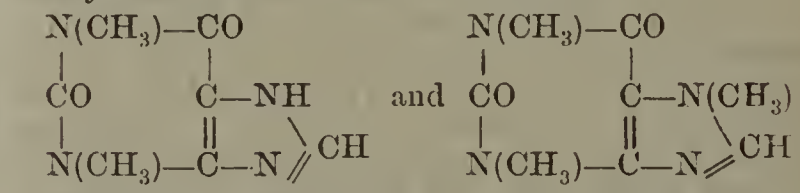
Alloxan together with urea is formed on the oxidation of uric acid.



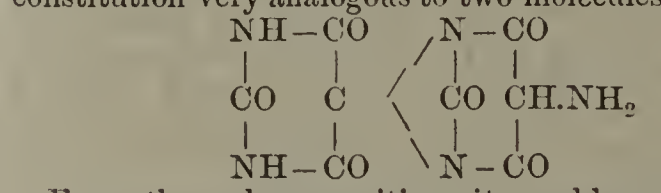
Uric acid, then, is probably built up of a tricarbon nucleus and two urea nuclei. The correctness of this formula is also shown by another class of derivatives of uric acid. Xanthine is obtained from uric acid by reduction with sodium amalgam and has the formula—



Theobromine and caffeine or theine are di- and trimethyl xanthine and have the formulæ—



Finally all these bodies, uric acid, alloxan, xanthine, theobromine and caffeine yield on oxidation with nitric acid and addition of ammonia the purple body known as murexide, an ammonium salt of purpuric acid, having a constitution very analogous to two molecules of alloxan—



From these decompositions it would appear that the urea, not the glycocine, is the important element in the production of uric acid from urea and glycocoll, but what the exact decomposition is, we cannot at present presume to say.

This work has been done in the Laboratories of the Pharmaceutical Society; my thanks are due to Mr. Dunstan for his help and valuable suggestions.

The paper was illustrated by specimens, diagrams and experiments.

A discussion followed, in which the Chairman, Secretary, Messrs. Ranken and Short took part.

Mr. Dymond then took the chair and Mr. H. G. Greenish gave his Report on Pharmacology, "Notes on Nigella Sativa and Nigella Damascena."

The report was followed by a discussion, in which the Chairman, Secretary, Messrs. Lowe and Ranken took part.

The meeting then adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association held on the 12th inst., Mr. C. Parkinson, President, in the chair, a paper on "Photography by aid of the Incandescent Electric Lamp," was read by Mr. F. W. Branson.

The commencement of the paper related to the utility of photo-micrography to scientists as an easy and rapid method for obtaining photographic prints of microscopic objects to illustrate papers and as an aid in the production of blocks for book illustration by means of photo-zincography or some allied process. A description of the apparatus was next given. A large four-celled bichromate battery was used, with arrangements for increasing or diminishing the zinc area immersed in the solution, to which latter was added 1 per cent. mercuric sulphate. The lamp used was 2½ candle power, aspecial feature of the lamp being the frosted surface obtained by means of a special varnish, the advantage hereby gained being a strong but diffused and equal illumination in close proximity to the lamp, rendering condensing lenses, when low powers are used, quite unnecessary. A resistance coil of simple construction was included in the circuit to regulate the current and also to switch on the lamp for the requisite number of seconds. The description next related to an ordinary monocular microscope with short and wide tube, the eye-piece being inserted within the flange of a bellows camera, the ground glass of which receives the image of the object it is desired to photograph. A special arrangement of the lamp for use with high powers was also alluded to and shown. The use of the eye-piece for photography was recommended, provided that both eye-piece and objective possessed good optical properties. Objectives must have a flat field, perfect definition and preferably exact coincidence of visual and actinic foci. To determine this the author advised the placing on the microscope stage, in a slightly oblique position to the optical axis, a test plate having parallel lines or markings; the image of the central lines should now be formed, and if these photograph sharply the lens may be noted as a perfect one for photo-micrographic purposes, but if not the differences may easily be measured by means of the fine adjustment and either corrected by means of the addition of a biconvex lens to the objective or the focus may be altered after the visual focus has been obtained to the extent of the difference previously found. It was then stated that transparent objects must be stained before being submitted to the process, such reagents as picro-carmine, which gives non-actinic colours, being most satisfactory. The combined action of light and reducing agents on a sensitive photographic plate next received attention, as did also the manipulations requisite for the production of successful negatives and prints. Lastly, some advantages of the electric lamp were enumerated, the principal being the comparative absence of heat rays, also the very actinic character of the light when considerable battery power is used; the apparatus is, moreover, easy of manipulation. The object photographed before the meeting was a transverse section of echinus spine, a two-inch objective being used with thirty minutes' exposure. The specimens exhibited included some very good photographs, showing early progressive embryonic development of the chicken.

A discussion followed, in which the President, Messrs. Glew, Killick and Leckenby took part.

A vote of thanks to Mr. Branson for his valuable and interesting paper was proposed by Mr. Allen, seconded by Mr. Snow, and carried with acclamation.

Parliamentary and Law Proceedings.

Patent Medicines.

The following is the text of the Bill introduced into the House of Commons by Mr. Warton, the second reading of which is fixed for the 26th inst.:—

A Bill to Restrict the Sale of Patent Medicines.

Whereas patent medicines containing poison have caused sickness and death:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. From and after the first day of January, one thousand eight hundred and eighty-five, any person claiming to be a proprietor or part proprietor of any patent medicine, and any vendor or purchaser by wholesale or retail of any patent medicine, may require the same to be analysed by the Pharmaceutical Society of Great Britain.

2. If the said Society find on analysis that any patent medicine contains poison, such poison being one of the poisons in Schedule A. of the Pharmacy Act, 1868, or declared to be a poison by the said Society by resolution within the powers contained in the second section of the said Act, then the said Society may from time to time by resolution declare that such patent medicine contains poison; and thereupon the said Society shall submit the said resolution for the approval of the Privy Council, and if such approval be given, then such resolution and approval shall be advertised in the *London Gazette*; and on the expiration of one month from such advertisement, the patent medicine named in such resolution shall be deemed to be a poison within the meaning of the said Act.

3. If the said Society find on analysis that any patent medicine does not contain poison within the meaning of the second section of this Act, the said Society may from time to time by resolution declare that such patent medicine is free from poison; and thereupon the said Society shall submit the said resolution for the approval of the Privy Council, and if such approval be given, then such resolution and approval shall be advertised in the *London Gazette*; and on the expiration of one month from such advertisement, the patent medicine named in such resolution shall be deemed to be free from poison, and any proprietor or vendor thereof may label the box, bottle, vessel, wrapper, or cover in which such patent medicine is contained with the words "free from poison."

4. Any patent medicine shall, unless and until the said Society have analysed the same, be deemed to be a poison within the meaning of the Pharmacy Act, 1868.

5. The sixteenth section of the Pharmacy Act, 1868, shall be read and construed as if the words "nor with the making or dealing in patent medicines" were not contained therein.

6. This Act shall be read and construed with the Pharmacy Act, 1868, and any Act amending the same.

7. This Act shall not extend to Ireland.

Poisoning by Phosphorus Paste.

On Tuesday an inquest was held before the Borough Coroner, Mr. J. C. Malcolm, at Armley Gaol, Leeds, on Bridget Hogan, aged 47, who died at the gaol on Saturday from the effects of taking phosphorus paste on the previous Wednesday, she at the time being under remand on a

charge of attempted suicide. The evidence showed that the deceased had been in a low state of mind for some time past. In returning a verdict of "Suicide whilst labouring under temporary insanity," the jury desired the Coroner to call the attention of the Home Secretary to the dangerous nature of Steiner's Phosphorus Paste, used for the destruction of vermin, and the facilities offered for obtaining that preparation for unlawful purposes.—*Leeds Express.*

MYSTERIOUS CASE OF POISONING BY STRYCHNIA.

On Tuesday, Dr. Housely, district coroner for Retford, resumed an inquiry which had been adjourned from the 17th of last month at Warsop, near Mansfield, as to the death of Hannah Head, a girl, ten years of age, who had died on the 16th of February from having taken Epsom salts, supposed to have contained strychnia.

The following evidence was taken :—

Mr. G. Stein, surgeon of Warsop, said that on Monday, February 18, he made a *post-mortem* examination of the deceased. The body was very thin. The hands were clenched, the fingers being drawn into the palms of the hands. The feet were clubbed, the soles being arched. There was lividity about the lips. The expression of the countenance was natural. On opening the body he found the right cavity of the heart to contain blood, which was fluid and dark. After the *post-mortem* he was not able to state positively the cause of death, and considered an analysis necessary. The symptoms were consistent with poisoning by strychnia. Witness placed the stomach and its contents into a jar, which was sealed and given to Police-constable Stevenson on February 18. The symptoms somewhat resembled tetanus, which was a spasm of the muscles. On Saturday night, February 16, witness received a packet said to contain Epsom salts.

Police-constable Stevenson, stationed at Warsop, said he received from Dr. Stein the packet said to contain salts, on Monday, February 18, and a jar containing the stomach of the deceased. The jar was sealed. These together with a small bottle of toothache tincture he delivered to Dr. Truman, of Nottingham.

Dr. Edgar Beckit Truman, of Nottingham, county analyst, said that on February 20, he received from the last witness three articles—a white jar sealed and unbroken, a blue paper containing what was said to be Epsom salts, and a bottle of toothache tincture. The jar contained the stomach, which weighed thirteen and a half ounces. There was no diseased appearance about the coating of the stomach. The contents amounted to eight and a quarter ounces and consisted of a brown fluid with an acid reaction and some animal flesh, probably ham fat, and potatoes. Witness took half of the stomach and half of the contents and submitted them to analysis. He found evidence of the presence of sulphate of magnesia, commonly called Epsom salts, and also of strychnia. The strychnia obtained from the stomach gave the usual reaction. Witness examined the remainder of the stomach for poisons with a negative result. He next examined the salts of which the packet produced was the residue. There were 355 grains of it. He found that in a teaspoonful levelled there were 52½ grains, but tested it for mineral poisons with a negative result and also for oxalic acid, of which there was also none. Strychnia was present in varying amounts, on an average 3 per cent. In a teaspoonful there would be about a grain and a half. The small bottle simply contained a solution of camphor and chloroform.

The Coroner: If a child lived four hours after taking strychnia would a much larger quantity have been taken than you found in the stomach?

Dr. Truman: If the child had died sooner more strychnia would have been found. Half a grain has been known to produce death.

Does strychnia undergo any change in the stomach?—No.

How much strychnia would it require to kill a child ten years old?—I should think a quarter of a grain would be a fatal dose.

How soon do the symptoms commence?—They may commence in a few minutes, but usually half an hour elapses.

How long does a person usually live after taking a poisonous dose?—About four hours only.

By a Juror: There was no colouring matter in the salts. It was alkaloid strychnia, and would take some time before undergoing the change by solution. That would account for the time the child lived. After hearing the evidence of the father of the deceased witness was of opinion that the cause of death was strychnia poisoning. The symptoms mentioned by the father in the child on the preceding Friday arose from strychnia poisoning.

Elizabeth Head, stepmother of the deceased, stated that the first lot of strychnia she bought was from Mr. Potts's shop, Mansfield, a year and a half ago. She bought a shilling's worth, and this was used in a short time for the purpose of poisoning rats. Subsequently witness took the empty bottle to Mr. Wood's, and purchased another shilling's worth of strychnia. If she had been twice to Mr. Potts's shop, she believed she took the same bottle. Afterwards witness's husband said, "There, I have made an end of all," meaning, as witness supposed, that he had thrown the strychnia into the fire. Witness had not bought strychnia at any other place, and had not known her husband to bring any into the house. Witness was in the house when her husband told the deceased child to fetch the salts. She bought two ounces. It never occurred to witness to throw away the salts after the child had the first twitchings, on the Friday. She could not say where her husband kept the strychnia. No person in the house had the same symptoms as the child after taking the salts. The child's life was insured, but in what society she did not know. They had not received the insurance money. The child had been insured between two and three years.

By a Juror: The strychnia was purchased each time at the request of her husband. The salts were purchased about five o'clock, and placed in the cupboard. In the evening, about eight o'clock, a dose was administered to the deceased.

William Head said he believed that he told the deceased to bring two ounces of salts from Mr. Tyler's shop. It never occurred to witness to connect the child's illness with the taking of the salts. After the purchase of the last lot of strychnia the bottle was thrown by witness into the stream. None of the family had similar symptoms to the deceased after taking the salts. The packet from which he took the salts to give the deceased had the appearance of not having been previously opened. All witness's children were insured. The strychnia had been bought by witness's wife at his request.

Sarah Ann Bean, a married woman, residing near to the deceased's parents, said from what she had seen the child had been kindly treated. Witness went to Mr. Head's house on February 16, when deceased was ill, and was present when she died.

Ann Stevenson, the wife of Police-constable Stevenson, said that early in January she sent for some salts—two ounces—from the shop of Mr. Bloor. Witness took some herself and did not perceive any ill effects. About a week after witness gave some to her daughter and about an hour after she complained of her legs. These symptoms were exhibited on taking a second dose two days after. The child also experienced twitchings. On hearing that Mr. Head's child was ill she threw the remainder of the salts into the fire.

Betsy Ann Crossland, of Warsop, deposed to being attacked by twitchings in the arms and legs after taking a dose of salts purchased at Mr. Bloor's shop.

George Tyler, chemist and druggist, of Warsop, was

next called. After being cautioned by the Coroner, he should, he said, prefer to give evidence. He said he was not registered as a chemist under the Pharmacy Act, 1868. He sold Epsom salts, weighing them into packets. He remembered the deceased coming to his shop on the first Friday in January for salts, but supplied her with a two ounce packet, which was labelled bearing the name of John Bloor. Witness was the manager to Mr. Bloor, and had been in that position from eleven to twelve years. All the labels bore Bloor's name. Witness did not keep strychnia in the shop, but occasionally got it from Mr. Bloor's other shop at Mansfield Woodhouse for making a solution from the British Pharmacopœia, but had never kept strychnia in stock. The bulk of Epsom salts from which witness supplied the deceased were obtained from Messrs. Barron, Harvey and Co., London. It was impossible for the salts to become mixed with strychnia.

The Coroner, then, addressing the jury, said if they thought any practical purpose would be served by keeping the inquiry open they would again adjourn, but if they were satisfied with the evidence before them, he would sum up. The jury intimated that it was impossible to carry the inquiry further, and the Coroner at great length carefully reviewed the evidence given by the witnesses. He said he need not tell them that that was a remarkable and mysterious case. The inquiry was first as to the cause of death, and as to that he did not think they would have any difficulty. They had been told that the symptoms the child exhibited were consistent with strychnine poisoning, and the analysis confirmed that supposition. The next question for them to decide was how that strychnia became mixed with the salts, and then whether it was administered wilfully or not. If these questions could not be satisfactorily answered it would be better to return an open verdict simply specifying the cause of of death, and leaving the questions as to how the strychnia became mixed with the salts, and whether it was wilfully administered or not, open.

The Jury, aiter about a quarter of an hour's deliberation, returned a verdict to the effect that death was attributable to strychnine poisoning, there being no evidence to show how it became mixed with the salts.—*Nottingham Journal.*

Reviews.

A Manual of Chemistry. By Henry Watts, B.A., F.R.S. Vol. I. Physical and Inorganic Chemistry. Thirteenth Edition of Fownes' Chemistry.*

When a book has reached, as this one has, the thirteenth edition, it may fairly be considered as outside the range of general criticism. Neither need we with this book and in this Journal stop to give an account of its contents, for, it is to be remembered, the work originally emanated from the Professor of Chemi-try to the Pharmaceutical Society, Mr. Fownes, and ever since its first appearance has been the standard text-book on chemistry for pharmaceutical students. The hand of Mr. Watts, who has edited the later editions of the work, is and has been prominent in the best sense, and this in many ways. One of the most important, perhaps the most important, way in which Mr. Watts's admirable editing is exemplified is in the definite and consistent system of nomenclature which is adopted and logically developed throughout the volume. Indeed, Mr. Watts's salutary efforts in this direction are well known and by no means restricted to the present case, but are also noticeable in his editing of the *Journal of the Chemical Society* and in many other literary undertakings with which he is associated. For the chemical student nothing is at once more important and necessary than that he should be unhampered and unfettered in his work by an illogical and arbitrary nomenclature. This, unfortunately, is too seldom the case in the majority of chemical manuals, where there is often more evidence of loose writing than of sound thinking, and where it is customary to sacrifice exactness in this respect to profuseness and even to prolixity in details which are often in themselves relatively unimportant. The anomaly reaches its height and is much more acutely felt in organic chemistry. Nothing is more fatal than this to the progress of the true student who seeks to find a connected and orderly sequence of facts designated by a correspondingly connected and orderly series of names. Accuracy, simplicity and consistency in nomenclature must for ever be one of the first canons in scientific criticism. True progress in chemistry, as in everything else, consists, at bottom, in the development of order, and until this has been attained, especially in chemical nomenclature, the eminent German physiologist and logician who lately affirmed that "chemists are at strained relations with logic and grammar" will remain unanswered—because unanswerable. But to return to the volume before us. The first section, which relates to chemical physics, has been very well brought up to date and the same may be said of the bulk of the volume; in fact the work is still in every respect worthy of the greatest confidence, and no doubt will retain its high place as a standard text-book for pharmaceutical students. At a time when crowds of typographical errors and altogether inexcusably careless mistakes stand naked and unashamed, and are even winked at by critics, in one of our great treatises on chemistry, it should be a compliment to the author of a less ambitious work to say that it is peculiarly free from such offences against literary decency. On p. 265 the "Cl_2," which is stated to be formed when Si_2C_2N is oxidized, should obviously be CO_2. "Octahedrons" (p. 409) is an innovation that perhaps is defensible. A little consistency might with advantage be observed in naming authors; thus we read on the one hand of "Dr. Frankland," "Dr. Odling," "Dr. Gladstone," etc., and on the other of "Crookes," "Roscoe," "Joule," "Tyndall," etc. The diæresis upon the "i" in "haloid" and in "alkaloid" seems of doubtful necessity.

* London: 1883. J. and A. Churchill. Crown 8vo. Pp. i-xvi., 1-595. 9*s*.

A Short Manual for Monthly Nurses. By Charles J. Cullingworth, M.D., etc.*

This little book is said to owe its existence to a regret expressed that the author's 'Manual of Nursing' did not deal with the subject of obstetric nursing. However this may be, we have no doubt that it is capable of being extremely useful, not only to the class for whom it is ostensibly written, but for others who from force of circumstances may have to undertake similar duties more or less involuntarily. The text is clearly written, without obscurations due to technical expressions, and whilst affording valuable information as to the best course to be taken under certain emergencies, it affords no encouragement to the nurse to step outside her proper sphere.

BOOKS RECEIVED.

Excerpts from Professor Hugo Schiff's Treatise on Eucalyptus Oil. Translated and Supplemented by Baron Sir F. von Mueller, K.C.M.G. Sydney: L. Bruck. 1884.

On the Discovery of the Periodic Law and on Relation among Atomic Weights. By John A. R. Newlands, F.I.C., F.C.S., etc. London: E. and F. N. Spon. 1884.

* London: J. and A. Churchill. Fcap. 16mo. Pp. i.-viii., 1-80. 1*s*. 6*d*.

THE GOLD-HEADED CANE. Edited by WILLIAM MUNK, M.D., F.S.A. London: Longman, Green and Co. 1884. From the Publishers.

AIDS TO PHARMACY. By ARMAND SEMPLE, B.A., M.B., etc. London: Baillière, Tindall and Cox. 1884. From the Publishers.

AIDS TO PHYSIOLOGY. By B. THOMPSON LOWNE, F.R.C.S. London: Baillière, Tindall and Cox. From the Publishers.

AIDS TO BOTANY. By ARMAND SEMPLE, B.A., M.B., etc. London: Baillière, Tindall and Cox. 1883. From the Publlshers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PHARMACEUTICAL SOCIETY.

Sir,—Mr. Hart seems to have made up a man of straw for the sole purpose of knocking him down. I have never said that "The Pharmaceutical Society was not entitled to the slightest share of our gratitude;"—on the contrary I have constantly asserted that had it not been for the Society, the chemists and druggists would have been in a very different position from what they now are. But for all that I do not see that I am bound to fall down and worship the Council, or to say that everything it may say or do is the only proper thing to have said or done. There have been times when resistance to the propositions of the Council was essential to the liberty of the trade, and I think there are very few now who are sorry that the resistance was effectual.

I cannot see why Mr. Hart should drag the Benevolent Fund into the question; no doubt the relief of distressed members of the trade is a praiseworthy object, but I do not conceive that the Society exists only for that. Nor do I think nor have I ever said "that one of the principal reasons why the Council exists is to see that pharmacists are not summoned on juries." What I did say on that head, and what I still contend, is, that if a pharmacist is summoned on a coroner's jury and is threatened by the coroner with a fine (in the event of his refusing to attend, the Council ought to take up the case and if necessary defend it in a court of law, and that they ought to let it be known that they will do so. Individual effort is very essential to the success of any cause, but individuals can hardly be expected to fight the battle of the whole Society at their own sole costs and charges.

I am at a loss to understand Mr. Hart's remarks about Local Secretaries and Local Committees, for I do not know of any to whom they apply; but as Local Secretaries are chosen by the members of the Pharmaceutical Society, and Local Committees by the members of their respective Associations, I suppose the electors have chosen those whom they consider the most suitable men.

It seems, however, after all, that Mr. Hart is not altogether satisfied with the policy of the Council, but has his own special grievance, and wishes it to adopt a more vigorous course in that particular direction, forgetting apparently that neither the Pharmaceutical Council nor any other Council has the slightest right to interfere with any man's trade in this country, so long as he is not acting illegally.

To those writers who are either ashamed of their productions or afraid to acknowledge them, but under the convenient shelter of a fictitious signature indulge in statements they cannot justify, I make no reply; but would suggest that if any such persons know of people trading illegally, their time would be more profitably employed in furnishing the Registrar of the Society with evidence to enable him to prosecute.

Cheetham Hill. W. WILKINSON.

THE POSITION OF PHARMACY.

Sir,—That the position of pharmacy in this country at the present time is in a very unsatisfactory condition it would, I think, be idle to attempt to deny. The mass of evidence in proof of this assertion collected with such commendable energy by Professor Attfield, from various parts of the country, is simply overwhelming. Complaints of competition by unqualified traders reach us from every part, and murmurs, loud and long continued, against the inaction of the Pharmaceutical Society are heard on every hand. Nay, it is no uncommon thing to hear those whose want of business capacity is a conspicuous cause of their failure to earn a livelihood, lay the blame of their non-success upon the Pharmaceutical Society.

Competition from unqualified traders does not date from yesterday. From time immemorial, salts, senna, sweet spirits of nitre, syrup of rhubarb, tincture of rhubarb, and numerous other drugs and pharmaceutical preparations have been vended by grocers, hucksters, etc., etc., until they have acquired a kind of prescriptive right to the sale of them. Those of us who are anxiously waiting for any legislative enactment which shall restrict the sale of these articles to the qualified pharmacist, will, in my opinion, be doomed to sure disappointment. Moreover, the supply of drugs, etc., to these men will continue, and, however distasteful it may be to us, as qualified pharmacists, we may occasionally find ourselves so situated that out of pure self-defence we have no alternative left but that of supplying these men ourselves. Those of our members who have the fortune to reside in this neighbourhood will, I think, readily understand my meaning.

Our success as pharmacists will not be brought about by any Act of Parliament, but by our own individual effort, by taking care to place the stamp of individuality upon our business, by trying so to win the confidence of our customers that we need fear no competition either from stores or hucksters, always remembering that the calling of a pharmacist is after all quite as much a business as a profession.

72, Lancashire Hill, Stockport. THOMAS HART.

Junior.—If the father is alive, and the business belongs to him, the course would be legal.

Mr. J. P. Henry is thanked for his communication.

W. Robinson.—(1) You will find the sum properly acknowledged, *sub* "Newthorpe," p. 692, col. i. (2) See a paper on bleaching sponges, before, p. 88. (3) Tome's 'Dental Surgery.'

J. Richards.—See under "Succus Glycyrrhizæ" in 'Pharmacographia.'

H. C. H.—*Chrysosplenium oppositifolium.*

A. E. I.—The careful generation of chlorine would be sufficient for the purpose.

"*Rumex.*"—We think the form of the circular and the reputed action of one of the ingredients would suggest the wisdom of not making the experiment except under medical advice.

G. C.—To meet the views of particular prescribers the preparation is sometimes made of a gelatinous consistence by the use of soft soap.

H. B.—Hydrargyri oxid. rubrum.

J. Hardy.—We are unable to go beyond the official report in the publication of correspondence addressed to the body in question.

H. Shaw.—(1) Clinical experiments made by Mr. Ashburton Thompson appeared to show that amorphous phosphorus, free from normal phosphorus, is inert in the human system (*Pharm. Journ.*, [3], vi., 41). (2) Glycerine of tragacanth.

J. H. S.—Glycerine of tragacanth. You are recommended to consult the prescriber as to whether powders were not intended.

Student.—The object of the examination is, to quote the words of the Calendar, "to ascertain that the candidate has such an amount of ability, and made such use of it in the acquirement of elementary knowledge, as to justify the expectation of his proving a successful student." You will see therefore that we are unable to mention any one book that would enable you to prepare yourself for the competition.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Pickering, Van Eeden, Symes, Turner, Smith and Co., Scott, Richards, Inquirers, Anon.

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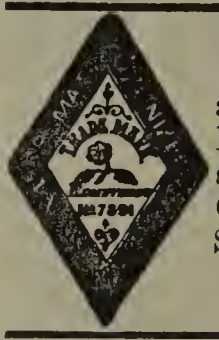

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Those for Businesses, Assistants, Engagements, &c., will be found on page XXI.

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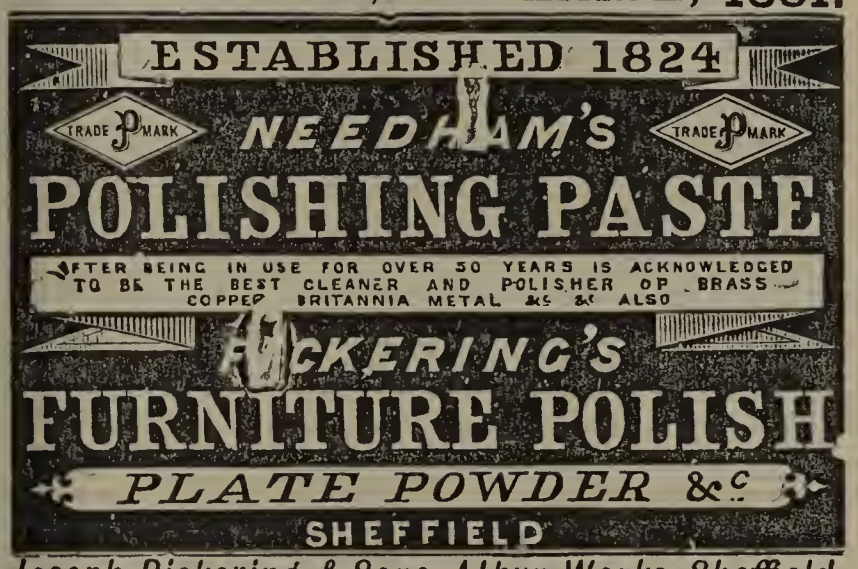

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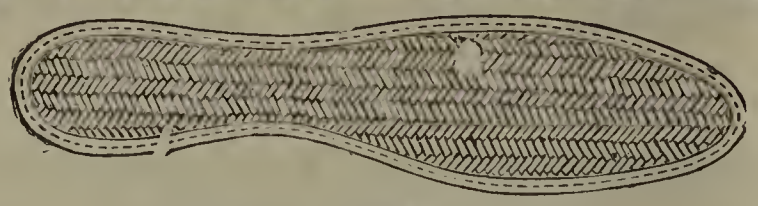

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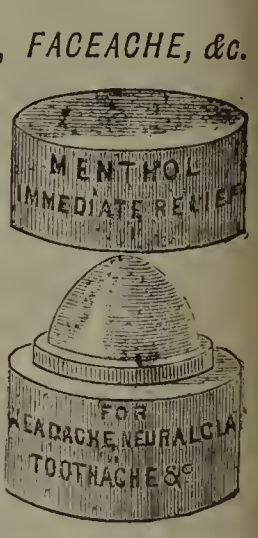

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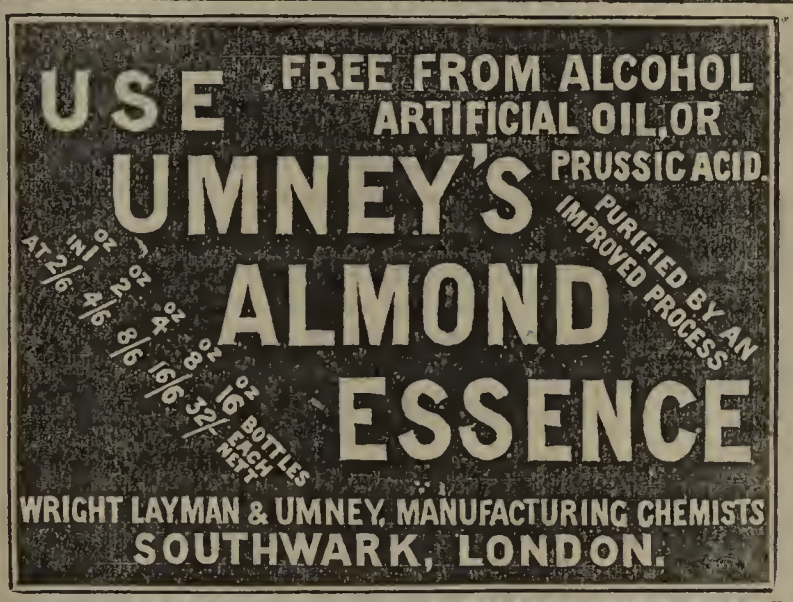

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March 10*th*, 1884.

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At the Examinations held in London last month the following Candidates from this School were successful in passing their Minor Examination:—

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BROUMPTON, FREDERICK RICHARD
CLARKE, RICHARD
FARLOW, JAMES SOUTHWARD
FELLOWS, VINCENT LITCHFIELD
MACK, GEORGE HENRY
RAMSEY, WILLIAM
WELLS, ARTHUR JOHN

The next Course will commence on April 28th, entries for which should be made at once in order to secure benches. For Prospectus, apply to

Messrs. LUFF & WOODLAND,
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"SYSTEMA OMNIA VINCIT."

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325, KENNINGTON ROAD, S.E

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing April 15th.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

WESTMINSTER COLLEGE

TRINITY SQUARE, LONDON, S.E.

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Students of ordinary ability may rely upon passing in July.

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MAJOR.

ONE Student **ONLY** presented himself for examination and passed.

Mr. T. RANDALL.

MINOR.

Mr. J. ALDERTON.
„ S. ARTHUR.
„ W. BARRATT.
„ J. BATES.
„ S. G. BAKER.
„ W. J. BAKER.
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„ T. COCKERELL.
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Mr. J. P. LEACH.
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„ J. R. SHALLCROSS.
Mrs. M. A. SINCLAIR.
Mr. C. B. SOUTHWELL.
„ W. SPRATLING.
„ E. WOOKEY.

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Special Classes to prepare Candidates for the Preliminary Examination of the Pharmaceutical Society are held daily, from 10 to 12 a.m., on the following subjects:

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AS MANAGER. Age 32. Qualified. Single. Accustomed to Dispensing, Prescribing and Teeth Extracting. Varied experience in town and country. Provinces preferred. ALPHA, 78, Wells St., Oxford St., London, W.

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Board Room, Steelhouse Lane, March 11, 1884.

MESSRS. HAIRSINE & CO., 47, Haymarket, require a Junior ASSISTANT, with Minor qualification, for 1st of April.

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AN ASSISTANT, with Minor qualification. One seeking permanent situation, for a very good class suburban Dispensing business. One Assistant only is employed. Salary to commence, £50. Indoor. Apply, with carte, to R. THOMAS, 38, Linnet Lane, Liverpool.

IMMEDIATELY. An active trustworthy ASSISTANT, accustomed to a good class country business. Age about 24 years. Two kept. Apply stating age, salary, &c., to RICHARD M. PRATT, Pharmaceutical Chemist, Otley.

ASSISTANTS WANTED.

AN APPRENTICE in a Dispensing business. References can be obtained from parents of four Pupils. Apply to Mr. C. J. ROBINSON, Chemist, Streatham, London, S.W.

BY April 10th.—A gentlemanly ASSISTANT of good address and appearance. Must be a neat and accurate Dispenser and accustomed to good class Retail. Age about 22 or 23. With Minor qualification preferred. Apply, FRANCIS CARTER, Pharmaceutical Chemist, Carshalton, Surrey.

JUNIOR, by the middle of April. Apply with full particulars as to salary &c., and if convenient enclose carte. JOHNSON & BULLEN, Ashby-de-la-Zouch.

AN ASSISTANT with experience in Dispensing and capable of taking charge in absence of principal. Time for study if required. Apply, if personally, in the evening, Mr. HULME, 97, Ebury St., S.W.

ABOUT the 15th.—JUNIOR. Age about 21. To give his whole time; hours 8 till 10, with alternate Sunday duty. One only kept. Salary to commence £35, with £5 extra to an abstainer. W. G. TAPLIN, 75, Hampstead Rd., London, N.W.

ASSISTANT, in-door. Minor qualification. 25 to 30. Must be steady, and attentive to business. Two kept. A comfortable home. Apply, stating age, height, salary required, enclosing references and carte (to be returned), to J. C. ROSS, 66, Church St., Warrington.

OUT-DOOR ASSISTANT, immediately. State last reference, salary required, and usual particulars, to Mr. FIELD, Chemist, Brighton.

ASSISTANT, immediately. Good Dispenser, with first-class experience. Gentlemanly appearance. Reply, enclosing references, carte (to be returned), stating age and salary required, to G. E. BRIDGE, The Firs Pharmacy, Bournemouth.

JUNIOR, with Minor qualification. In-door or out-door. Must be a quick and accurate Dispenser, and write a neat hand. Apply, stating age, height, and enclose photo., to ARTHUR I. JOSEPH, Chemist, St. Leonards-on-Sea. Also a vacancy for an APPRENTICE or IMPROVER.

A STEADY out-door ASSISTANT in general Country business. No Sunday work. Apply, stating usual particulars, ROBSON & SON, 67, Eastboro', Scarboro'

LOWESTOFT HOSPITAL.—A legally qualified DISPENSER. Attendance, Mondays, Wednesdays and Fridays from 12 till 7, and about one hour in the evening of other days. Apply, stating qualifications and salary required, to Mr. J. E. COOK, 140, High St., Lowestoft.

AN efficient ASSISTANT whose experience has been gained in good-class houses. Reference must be unexceptionable. PADWICK, Pharmacist, Red Hill, Surrey.

A COMPETENT in-door ASSISTANT, an accurate Dispenser and good Counterman, who is well acquainted with first-class Retail. State age, experience, and salary required, with carte (to be returned), W. T. FROST, 125, Lee Rd., Blackheath, S.E.

A JUNIOR ASSISTANT of good address, and used to a good class Dispensing business. Apply, with carte (to be returned), stating age, height, salary, &c., to J. BEALE, Pharmaceutical Chemist, Bournemouth.

A COMPETENT in-door ASSISTANT, an accurate Dispenser and good Counterman, who is well acquainted with first-class Retail. State age, height, references, experience and salary required, with carte (to be returned), to H. GOODALL, Derby.

IMMEDIATELY.—A competent ASSISTANT, between 25 and 30 years of age. One who has passed the Minor examination preferred. Must be a good Dispenser, and able to manage in the absence of the principal. Apply to W. M. HOLMES, 63, Lupus St., London, S.W.

ASSISTANTS WANTED.

IN a good provincial pharmacy on the South Coast (for Retail and Dispensing counter), a steady and obliging ASSISTANT. Hours easy. No Sunday nor night duty. Apply (photo. if possible) to Mr. A. W. SMITH, Rye, Sussex.

A MIDDLE aged man, single, to MANAGE a branch. Good references required. Apply to Mr. JOHN WOOLSTENCROFT, Chemist, Carnforth.

IMMEDIATELY.—An experienced ASSISTANT as SENIOR. Qualified, and accustomed to first-class Dispensing business. Apply, with usual particulars and carte, to W. H. PULLIN, Leamington.

A COMPETENT in-door ASSISTANT, not under 24. An accurate Dispenser and Good Counterman, who is well acquainted with first-class retail. Also a JUNIOR. Short hours. Two kept. State age, height, references, experience, and salary required, with carte (to be returned). C. L. METCALFE, Pharmacist, 13, Whitefriargate, Hull.

BUSINESSES FOR DISPOSAL.

MESSRS. HINE GILBERT have for transfer:—Near LONDON. Old-established Business. Returning £800. For £350 only. Rent £30. CITY. High class old-established concern. Returning £2300 annually. Price £1000 cash, and time for balance. SEASIDE. Returns £1100. Cash £250. MIDLANDS. Returns £550. Most profitably. Price £300. Good house. Another. Century in present family. Through death. Returning over £3000. About £2000. Part remain. Strictly genuine. Partner wanted for SOUTH COAST business. Apply at 17, Hart St., Bloomsbury Sq.

TO Chemists and Surgeons.—On easy terms. An old-established BUSINESS, in a market street near Finsbury Sq., present proprietor being unable to attend to it. Lease, if desired, can be secured at low rental. Excellent opening for young beginner. For particulars apply by letter to A. B., 144, Hampstead Rd., N.W.

DENTAL PRACTICE.—An unusual opportunity for a Pharmacist, &c., about practising Dentistry solely. A small genuine concern of about £200 a year. Eligible situation, E. of London. Residential and of easy rent. Premium required (including appurtenances), £100. Address, DENS, Mr. Braddock, 6, Lower Clapton Pl.

MORECAMBE, Lancashire. — In consequence of death. An old-established Chemist's, Wine, Spirit and Bottled Beer BUSINESS, carried on successfully for 16 years by late proprietor. For further particulars address, Mrs. GARDNER, Queen St., Morecambe.

£300.—A light Retail, Dispensing and Prescribing BUSINESS. Returns over £300. Well situated. Good house and shop. Capable of great increase. On lease. No agents. Address, F. W., care of Messrs. Edwards & Son, 157, Queen Victoria St., London.

TO Chemists or Medical Men.—First-class Freehold, with Chemist's BUSINESS. House and shop adjoining, with land. Whole forming a compact property. Part of purchase money can remain on mortgage. Bargain for parents desiring to put their son in business and invest capital. Apply, Mr. JOHN LEES, Auctioneer, Reigate.

A GOOD-CLASS light Retail and Dispensing BUSINESS. 30 miles out. Very suitable for a young man commencing. First-rate position. Low rent. Full prices and long lease. Address W., 27, Manor Rd., Lewisham High Rd., London, S.E.

PARTNERSHIP.—Vacancy in a first-class Retail, Dispensing and Manufacturing business to assist in extending the manufacturing portion, which is of a very profitable character. Capital required £500 to £600. For full particulars apply, Messrs. JOHN ROUTH & Co., Commercial Bldgs., Leeds.

BUSINESSES FOR DISPOSAL.

YORKSHIRE (West Riding).—An old-established Retail and Prescribing Business, in central position. Returns about £700. Stock and fixtures at valuation. No goodwill. Stock will be reduced to suit purchaser if required. Large shop and good dwelling-house, with commodious warehouses. Apply, A. P. S., 24, South Parade, Huddersfield.

LANCASHIRE.—First-class light Retail, Dispensing, &c., with good sale of own Proprietaries. The returns, which are increasing, were last year £645. All at best prices. The town is one of the most pleasant on this coast. Shop well fitted and stocked. House fair. Rent low, on lease, and thoroughly satisfactory reason for selling. F. J. Brett, Leicester.

COVENTRY.—Light Retail. Good corner house. Rent £20. Present hands 11 years. Vendor succeeded to larger concern in native town. Cash, immediate purchaser, £105. Bargain. W. Litchfield, Chemist, Stafford St., Longton.

IN a fashionable town in the South of England.—Agricultural, Dispensing and Prescribing. Established over 40 years. Returns £550, at very large profits. Rent £45, on lease. Taxes £10. Price £450. Will bear the strictest investigation. For particulars write to Beta, care of Messrs. Barron, Harveys & Co., London.

YORKSHIRE.—A genuine Retail and Prescribing Business, in a manufacturing town, near Leeds. Returns £600 a year. Rent £30. Part purchase-money can remain. Trial allowed. Alpha, Messrs. R. Sumner & Co., Chemists, Liverpool.

GENUINE Dispensing and Retail. Northern suburbs. Returns £820. Long lease. Full particulars on application. Address, R., care of Messrs. Hearon, Squire & Francis, 5, Coleman St., E.C.

LANCASTER.—Owing to the death of proprietor (Mr. Geo. Suart). A Prescribing and Family Drug Business. Small Wholesale attached, which may be largely developed. Returns last year £670. Rent £40, with house. Immediate possession may be had. Apply to Messrs. Clay, Dod & Co., Wholesale Druggists, 52, St. Anne St., Liverpool.

CHEMISTS and Druggists.—Well-fitted Shop, in Commercial Rd., E., near Stepney Station. Premium £1. Splendid opportunity for Surgeon. Apply, 548, Commercial Rd., E.

AT once.—The Business of an old-established Chemist and Druggist, in Knaresbrough, Yorkshire, also the rights of an article called "James' Diamond Ointment," which has had a large sale in England for the last 40 years. All particulars given on application to the Executrixes of the late proprietor, E. James, Bond End, Knaresbro'.

IN one of the most thriving manufacturing towns in Lancashire. A thoroughly genuine Retail, Dispensing and Prescribing Business, doing a good trade. Capital scope for increase. Post Office and Gilbey's Agency attached. P.O. covers rent. Handsomely fitted shop. Good house and commodious store rooms. Will bear the strictest investigation. Established 18 years. Chemicus, 139, King St., Oldham.

A GOOD light Retail, Dispensing and Prescribing Business, situated West Central. Spacious corner shop. Good fittings and well stocked. For full particulars apply to Messrs. Burgess, Willows & Francis, 101, High Holborn.

A BARGAIN.—For immediate cash purchaser. A genuine ready-money Business, in good market thoroughfare. Doing £600 per annum. Splendid corner shop. Well fitted. House large and in good order. Price only £450 net. Address, Chemist, care of Housekeeper, 155, Fenchurch St., E.C.

BUSINESSES FOR DISPOSAL.

CHEMISTS and Druggists.—An energetic young man, with small capital, not objecting to a Mixed Business, would find it advantageous to purchase from advertiser. Already established in the Drysaltery, Oil and Colour trade. In a nice suburb 6 miles from London. The opening for a qualified Chemist is excellent, as a branch or otherwise. Premises well adapted for a Mineral Water Manufactory. Letter only, Chemicus, 9, Plassy Rd., Catford, S.E.

FOR SALE BY PRIVATE TENDER.

OWING to dissolution of partnership.—A small Wholesale Drug and Manufacturing Business at the West End, including stock, plant, fixtures, fittings, and sole right to manufacture well-known Specialities. Present returns average about £2000, might easily be doubled. Premises held on lease, 28 years unexpired, at moderate rent, including Laboratory, Warehouse, Office, and Dwelling apartments. The business has not been energetically worked, but there are about 300 customers on the books. To a responsible person, facilities would be granted for payment of part of the purchase money by instalments. The tenders will be opened on the 3rd of April next, at Ten o'clock. For further particulars, and orders to view, apply to Chemist, care of Housekeeper, 8, Old Jewry, E.C.

FOR SALE.

BEST plate glass Counter Cases, as fig. A 16, 2ft. 6in., 3ft., 3ft. 6in., 4ft., 5ft., 6ft., 6ft. 6in.; as fig. A 1, 5ft. long, £9; 3ft. 6in., as fig. A 4, £7; as fig. A 6, 5ft., £5; fig. A 7, 6ft. long, £6; as fig. A 9, 35s.; as fig. A 10, 50s.; large size, 60s.; 4ft., as fig. A 17, 80s.; 4ft. 6in., A 17, 85s.; 10ft., as A 15, £10; Desk and Case, plate glass, fig. 31; Show Steps, A 37, 70s.; A 38, 30s.; A 40, 45s.; Soda Water Stand, 45s., A 57; all the above cases are plate glass. E. Natali, 207, Old Street, E.C.

A 6 FT. plate glass Dispensing Screen, fig. A 55, very handsome figured mahogany, silvered glass back inside case, and fitted with glass (shifting) shelves, with polished edges, tablet on top; a 4ft. do. do., as fig. A 54. E. Natali, 207, Old Street, near Pitfield Street, E.C.

A ROTARY Pill Machine and Piping Press; 6 doz. 1-gall. white glass Tincture Bottles; 6 doz. 80-oz. ditto; Specie Jars, Ointment Jars, Fancy Jars, Brass Pillar Scales, fig. 1, 20s.; Pill Machines (to cut 24), 3, 4, or 5-grain, 16s.; 5-grain ditto, marble slab, 18/6; a number mahogany nests Drawers, glass labels and knobs, at 2/6 per drawer, 10 drawers to every 2ft.; 12ft. Spanish mahogany Counter, fitted with drawers; a 14ft. mahogany Counter, fitted with glass cases in front and drawers under; 12ft. mahogany top, grained front, fitted with drawers; 7ft. and 10ft. mahogany top Cupboards; a 6ft. mahogany top Counter, fitted with glass cases in front and drawers under; a quantity of mahogany fronted Shelving, Cornice, Pilasters, Lockers. E. Natali, 207, Old Street, near Pitfield Street, E.C.

A NUMBER of Mortars and Pestles; 5ft., 6ft., 7ft. splendid mahogany Dispensing Screens, glass case at each side, silvered plate glass centre, with marble slab in front, shelves at back for Dispensing bottles, with handsome tablets on top, £7 10s. E. Natali, 207, Old Street, near Pitfield Street, London, E.C.

A HANDSOME plate glass and mahogany Counter Case, with upright case on top, as fig. A 4, £7, 3ft. 6in. long; a 5ft. plate glass Counter Case, revolving front glasses, fig. A 1, £9; a 8ft., as fig. A 18, £8; 6ft., A 18, £6; 5ft., as A 18, £5; splendid mahogany and plate glass Wall Case, A 88, 8ft. long, £28; Sponge Cases, as A 41, 60s.; A 43, 90s.; Desk and Glass Case, fig. 31, plate glass, 60s. E. Natali, 207, Old Street, near Pitfield Street, E.C.

Messrs. TAYLOR & CO.

Valuers & Transfer Agents,

WALBROOK CHAMBERS, 38, WALBROOK,

LONDON, E.C.

HAVE THE FOLLOWING BUSINESSES FOR DISPOSAL:—

1. London, S.E.—Good ready-money Business. Returns £500, at full prices. Post Office attached. Price £450.
2. Cheshire.—Dispensing and light Retail. Returns about £450. Capable of great extension. Rent £30. Price £275.
3. London, S.E.—First-rate opening for a chemist on a large new estate. Good middle-class people. No chemist anywhere near. Very convenient house and large shop. Progressive rent. This is worthy the attention of an energetic man.
4. London, N.—Ready-money Retail, Dispensing and Prescribing. Returns about £550. Price £500.
5. Lancs.—Dispensing and Family Retail. Returns £1400. Good house. Price £1000.
6. Somerset.—Family Business, with a fair amount of Dispensing. Returns £450. Price £300. Good house, with garden and stabling. Rent £21.
7. Staffs.—Returns £550, at full prices. Price £300.
8. London, E.—Returns £350. Price £200. Rent £28.
9. London, E.—Very profitable Business. Returns about £500. Post Office attached pays rent. Price £450, of which £150 can remain. A bargain.

T. & Co. have over 200 other businesses for disposal. Particulars can be had on application.

Valuation appointments for March must be made as early as possible.

T. & Co. keep a Register of employers requiring assistants and assistants seeking situations.

DOUGLAS, ISLE OF MAN.

A RARE opportunity to investors or parties requiring good business premises.

To be Sold by Auction by Mr. S. Webb, on Thursday, April 3rd, 1884, those splendid business premises, situated No. 78, Strand St., Douglas, now occupied by Mr. T. S. Greensill, who has for a number of years carried on a successful business in the far-famed "Mona Bouquet," &c.

The premises contain large cellar, shop, sitting room, with entrance from main street, kitchen, out-houses, with large yard.

Good entrance from back lane. Drawing room, room over shop, and several good bed rooms, attics, &c.

The above premises are in every way suitable for carrying on a most extensive business, and are situate in one of the best business thoroughfares in Douglas.

Possession on 12th of May, 1884. Sale to take place at the owner's, Mr. John Woodruff, Old Strand Inn, three doors from the above premises, at 12 o'clock noon, when conditions will be declared.

For particulars apply to the Auctioneer; the Owner; or to Dickinson & Kneen, Advocates, Douglas, Isle of Man.

FOR SALE.

A QUANTITY of second-hand mahogany Drawers, 12ft. long, 8ft. and 6ft. long, with lockers underneath, drawers with white glass knobs and gold labels, at 2s. per drawer; an iron Tincture Press, one of Maw's, 18s.; several Specie Jars and other small Show Jars; 2 doz. black Stock Bottles, with tin lids, and several doz. Shop Rounds, all very cheap; a handsome Spanish mahogany Dispensing Screen, 6ft. long, 2ft. high, opens with 3 plate-glass doors, £6; a mahogany circular-fronted plate-glass Counter Case, as Maw's fig. A 18, 6ft. long, £5 15s., and a quantity of other glass Cases and second-hand Shelving. Bigrave, 12, Curzon St., Wenlock St., New North Rd., Hoxton, London, N.

Messrs. GURDEN BERDOE

Chemists' Valuers and Auctioneers,

30, JEWRY ST., ALDGATE, LONDON,

HAVE FOR TRANSFER:—

Wilts.—Old established first-class Dispensing Business, showing £500 net profit. For £1550. This is a strictly genuine reliable concern.

Gloucester.—High-class Family and Retail. Returning £600. Rent £25. Large house, garden, &c. For £400.

Hants.—Fashionable town. Returns £450, all cash. For £425.

East Coast.—Thoroughly genuine Family and Agricultural Trade. Returns £2000. Net profit £600. For £1600. Part might remain.

London.—Near park. A very genuine Retail. Well fitted. Returning £550. Net profit £230. Only £300.

S.E.—Handsomely fitted, well stocked, good class Trade. Returns £550. Net profit £250. For £450.

N.—Corner Retail. Same hands eight years. Recently neglected. Returns £350. Net profit £150. For £150. Part remain.

SALE BY AUCTION.

Messrs. Gurden Berdoe will sell, Monday next, March 24th, at one o'clock precisely, the complete Fittings of double-fronted shop, consisting of Counter, handsome Dispensing Screen, Wall Cases, Shelving, Carboys, mahogany Drawers, Bottles and effects, and will offer the same in one lot, to cover a low reserve; failing which, will sell in lots, as per catalogue. Particulars of the Auctioneers, 30, Jewry St., Aldgate; or on the premises, 238, Well St., Hackney, E.

Shop to Let, 20 miles out, offering rare opportunity for opening a Chemist's, which the above fittings will suit.

Mr. EDMUND RUTTER

Arbitrator, Valuator & Chemists' Agent,

4, MELVILLE TERRACE, DEVONSHIRE ROAD, TURNHAM GREEN, W.

Member of the Pharmaceutical Society, and upwards of 30 years' experience in every branch of the business.

Advice given at a small cost to gentlemen about embarking in or purchasing a business.

TEMPERANCE DRINK PRIZES

Under the Patronage of a Committee consisting of

The Earl of Lichfield	Rev. Prebendary Grier
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(With power to add to their number.)

The want of a good Temperance Drink which shall take the place of the cheap intoxicating liquors to which the public are accustomed has long been felt, none of the many Drinks hitherto in use having achieved more than a temporary popularity.

Two Prizes—the first of £700, and the second of £300—are now offered for the two best Temperance Drinks, under conditions, a copy of which may be obtained upon forwarding to the Secretary a stamped envelope bearing the name and address of the Applicant intending to compete. By Order of the Committee,

March, 1884. W. HODGES, *Secretary.*

Offices—Victoria Chambers, 55 and 56, Chancery Lane, London.

Attendance daily from 11 till 3 o'clock; except on Saturdays, when it will be from 10 till 1 o'clock.

Midland Counties' Transfer Agency.

F. J. BRETT,

Trade Valuer and Auctioneer,

LEICESTER.

VALUATIONS.—It is essential, to prevent disappointment, that engagements should be made early.

Businesses thoroughly investigated for Buyers.

YORKS.—In good medium sized town, fair class Family Retail and PRESCRIBING, returns £600, rent £35, price £350, or valuation.

BIRMINGHAM.—Returns £1200, Mixed RETAIL, with Drysaltery, capital position, price about £700.

LIVERPOOL.—Large noble CORNER, finely fitted, returns now £500, when personal attention was given £800, price to an immediate buyer £500, not the value of the fittings, an unusual chance.

CAMBRIDGESHIRE.—Retail, Prescribing, and some DISPENSING, as branch returns £300, rent can be covered by letting if desired, at valuation, £100.

NORFOLK.—Good country Retail and Agricultural TRADE, large house, garden, and greenhouse, returns £1100, price £900.

HEREFORDSHIRE.—Light country RETAIL, pretty part, good prices, returns £550, rent £30, price £300.

MANCHESTER.—Dispensing and light RETAIL, excellent house, returns about £1100, price £750.

SALE BY TENDER.

F. J. BRETT is instructed by the Executors of the late Mr. Townsend, Burton-on-Trent, to offer by tender the whole of the Stock-in-Trade, Mahogany Counters, Mahogany Wall and Counter Cases, Shop Rounds, Specie Jars, Carboys, &c., &c. Date of tender and further particulars in next advertisement. Information can be had of the Auctioneer, 23, Rutland St., Leicester.

Transfers, Valuations and Auctions conducted throughout the United Kingdom by Mr. BRETT, Leicester.

HENRY GADD,

Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

97, FORE STREET, EXETER.

Valuations undertaken for Probate, Transfer, or Arbitration.

Fullest information as to sale or purchase of Businesses given on application.

H. G. is instructed to offer the following businesses at a low price, as the proprietors are anxious, for reasons to be satisfactorily explained, to effect a speedy transfer:—

A.—Excellent BUSINESS, in large market town. Proprietor retiring. Will give successor assistance for a time if required. Price £1500.

B.—Old established BUSINESS. Corner shop. Returns average £900. Profitable trade.

H. G. will be happy to furnish particulars of many other businesses in town and country, returning from £200 up to £3000 per annum.

No charge to purchasers.

Instructions for either the sale or purchase of Businesses inserted in Register free of charge.

FITTINGS FOR CHEMIST'S SHOP WANTED AT ONCE.

FULL particulars to CHEMICUS, 8, St. Paul's Square, Southsea.

CHEMISTS' TRANSFERS.

32, LUDGATE HILL, LONDON.

MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

PURCHASERS who desire early information regarding eligible opportunities for entering business, will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

N.B.—No Charge to Purchasers.

MESSRS. ORRIDGE & CO. are instructed to transfer the following businesses, particulars of which, with order to view, may be obtained on application:—

1. LONDON.—Good class locality. An established BUSINESS, Retail, Dispensing and Prescribing. Returns £1800 to £1900 yearly. Net profit about £1200. Several good Proprietary Articles, well known. Large double-fronted shop and good house. Full particulars in confidence on personal application.

2. LONDON, W.C.—Returns at present about £10 per week. Can easily be doubled by personal attention. Situate close to one of the largest hotels. Price about £400.

A.—LONDON, S.E.	Returns	£1500.	Price	£1000.
B.—LONDON, S.W.	„	£617.	„	£450.
C.—LONDON, N.	„	£640.	„	£550.
D.—LONDON, N.E.	„	£850.	Offer.	
E.—LONDON, E.C.	„	£700.	Price	£650.
F.—LONDON, N.	„	£500.	Valuation.	
G.—LONDON, E.	„	£393.	Offer.	

3. DORSETSHIRE.—Unopposed country BUSINESS. All good class trade and no cutting prices. Returns nearly £1400. Profits very large. Good house. Well situate. Rent low. Full particulars in confidence on application.

4. NORTHAMPTONSHIRE.—Retail and Dispensing BUSINESS. Returns £600. Handsome shop, large house and good warehouses. Price £600.

5. YORKSHIRE.—Unopposed country BUSINESS. Returns nearly £950. Held by vendor many years, who is now retiring through ill-health. Small premium for goodwill. Stock and fixtures at valuation.

H.—SOMERSET.	Returns	£1300.
I.—WILTS.	„	£800.
J.—N. WALES.	„	£350.
K.—S. WALES.	„	£450.

Either of the above can be purchased at a small premium and valuation. Full particulars on application.

Other businesses, town and country. Particulars free on application.

VALUATIONS.

Terms for valuation on application.

ORRIDGE & CO.

32, Ludgate Hill, E.C.

NEW IMPROVEMENTS IN PHARMACY.

The Burroughs Inhaler

"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

Kepler Extract of Malt.

THE LANCET says of the Kepler Extract of Malt: "The best known, and in this country the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil." And further adds, "It is very good, and may be used with confidence."

McK. & R. Capsuled Pills.

An important improvement has been made, which now renders the most offensive and repulsive drugs easy of administration. This improvement consists in perfectly sealing with a thin transparent capsule of gelatine all drugs such as quinine, morphia, rhubarb, &c., also the various pills and powders of the Pharmacopœia. These capsules are of an ovoid shape, and it has been demonstrated beyond question that when ordinary coated pills are rejected by patients there is not the slightest difficulty in administering this new form.

Kepler Cod-Liver Oil with Extract of Malt.

This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

The Burroughs Beef and Iron Wine.

"This is a really valuable preparation, and, as far as we know, a novelty. It contains beef-juice and citrate of iron in solution in wine, and is therefore a very powerful and rapidly-acting tonic. Children, as well as adults, take it easily; and, as its taste is by no means unpleasant, it can hardly fail to attain great popularity."

Lawton's Absorbent Cotton

"Has been pronounced by some of our most eminent surgeons the very best absorbent for taking up discharges; it is very fine and soft, and acts instantly."—*The Medical Press and Circular.*

Hazeline.

Hazeline is distilled from the fresh green inner bark of Hamamelis Virginica, the American Witch Hazel. It represents, in a concentrated form, all the active principles of the plant. It is a clear, colourless fluid, having a fragrant, agreeable odour, and slightly astringent taste. Does not stain linen, and is entirely free from toxic or irritating properties.

The Wyeth Compressed Tablets

EXACT SIZE OF TABLET.

Of Chlorate of Potash and other drugs usually employed for throat affections. Chlorate of Potash with Borax; Chlorate of Potash with Chloride of Ammonium; Chloride of Ammonium with Borax, &c. The pure drug, without any addition, is compressed in very small lenticular discs, which are easily retained in the mouth while singing or speaking. The great advantage of these Tablets over the ordinary lozenges is, that they are free from the irritating saccharine matter with which ordinary lozenges are diluted. They are now almost universally prescribed by the profession in preference to the usual gargles, for when allowed to dissolve in the mouth the saliva becomes charged with the salt, carrying it directly to the affected parts, thus really securing all the beneficial effects of a continuous gargle without the injurious exertion which was required by the old method. Supplied in Packages at 1s., 2s. and 3s.

The Wyeth Soluble Compressed Hypodermic Tablets.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 718.] SATURDAY, MARCH 29, 1884. [PRICE FOURPENCE

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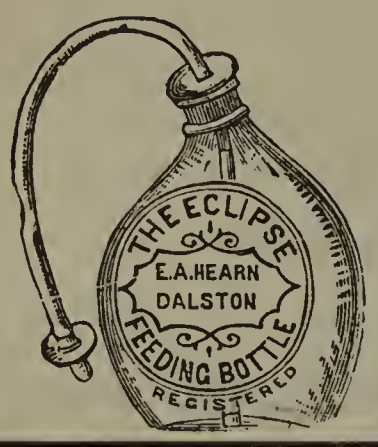

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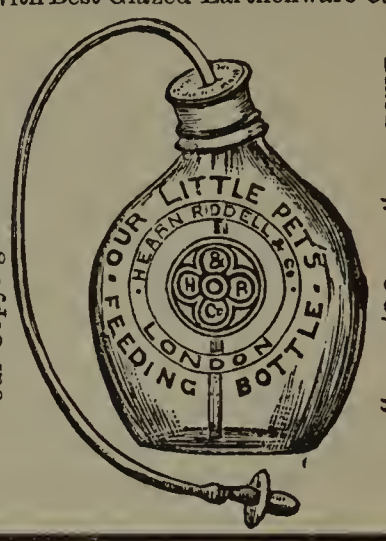

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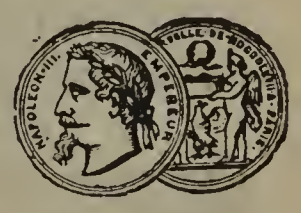

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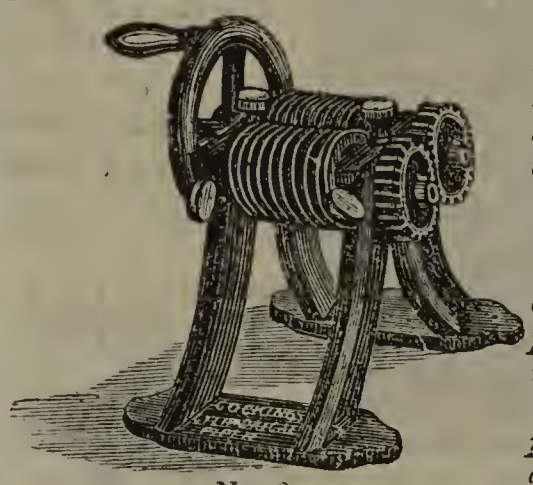

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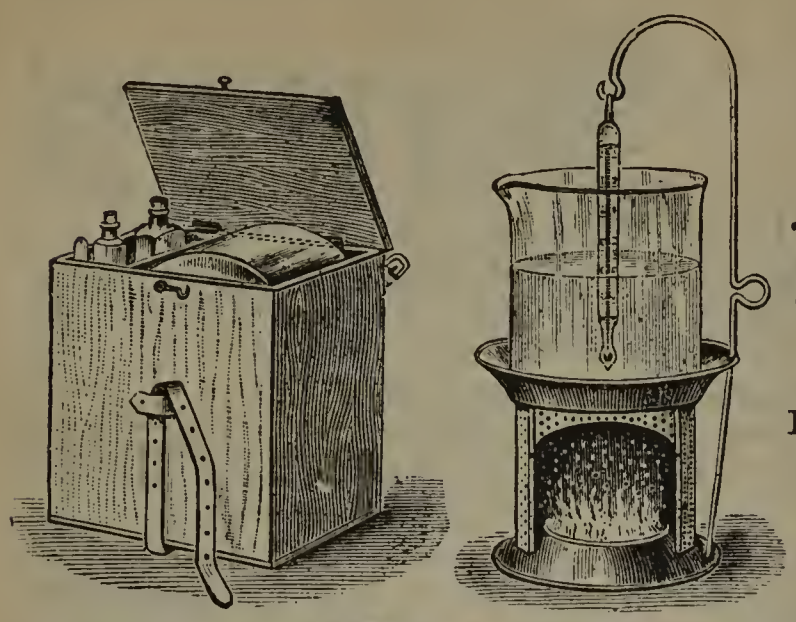

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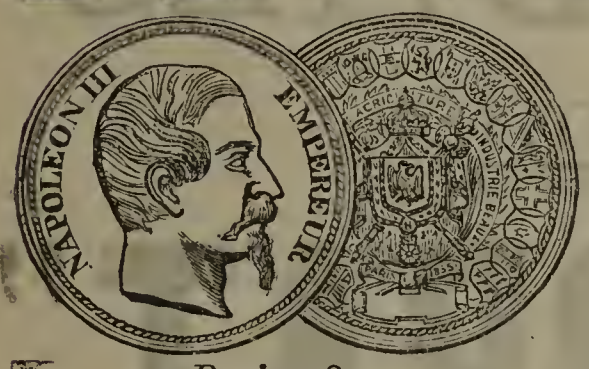

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Paris, 1867.

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"THE MONTH."

Mercurous tannate, the use of which was recently mentioned as having been recommended, appears to be attracting attention and is reported to have been tried in a South German university clinic in the treatment of syphilis with good results, whilst it was well tolerated by the patients (*Pharm. Zeit.*, March 8). The compound is said to be prepared by the precipitation of a solution of mercurous nitrate with potassium tannate and careful washing of the precipitate. In another journal (*Archiv*, March, p. 207) mercurous tannate is described as an odourless, tasteless, dark green powder containing about 50 per cent. of mercury. It is said not to be materially attacked by acids and not generally soluble without decomposition. Very dilute caustic and carbonated alkalies cause the separation of a slime consisting of mercury in such a minute state of division that when examined under the microscope the particles exhibit the phenomenon known as molecular movement. It is administered internally in doses of one decigram two or three times daily, and notwithstanding the comparative largeness of the dose it is said not to cause any disagreeable symptoms in the stomach or bowels. It appears to be rapidly absorbed into the system, being found in the urine twenty-four hours after administration.

Professor Eulenburg has communicated some information as to his method of treating neuralgia with osmic acid (*Pharm. Zeit.*, March 5). A one per cent. solution of the osmic acid crystals in distilled water is used and this should be kept in well closed bottles protected from the light. Notwithstanding this precaution the solution after a time darkens gradually and a dark, almost blackish, separation takes place, so that it is advisable to prepare only small quantities at a time. The darkened solution can however be used without disadvantage. The dose injected is usually 0·005 gram (=0·5 of the solution); in exceptional cases 0·01 gram (=1·0 of the solution) has been administered, but even this quantity produces no local or general disturbance. It is rather surprising that this pungent acid (resembling chlorine), which has a strongly irritating action on the outer cuticle, should cause so little pain when injected subcutaneously and scarcely produce any apparent change in the skin or tissue beneath it. At the most there is, as a rule, only a slight reddening or possibly an insignificant swelling in the neighbourhood of the puncture, but this quickly disappears. Sometimes the puncture may become blackened by the extrusion of a drop of the acid, but this has not been observed to cause any local inconvenience.

According to a note in the *Wiener med. Blatt.* (*Pharm. Centralh.*, March 13), the most suitable form for the administration of paraldehyd is an emulsion. The method and proportions recommended for the emulsion of 18 grams of paraldehyd are to rub an equal weight of powdered gum into a thick mucilage with a little water, then add a little paraldehyd, and after rubbing this to a homogeneous mass to pour in, in small portions alternately, the paraldehyd and sufficient water to bring the emulsion up to 150 grams; to this, add 30 grams of syrup. amygd. Dose, two tablespoonfuls. Each tablespoonful will contain about 1½ gram of paraldehyd; and should 3 grams not produce the desired effect, a second dose may be given half an hour after the first.

From experiments made on rabbits, it would appear, according to some details furnished by M. Baumetz to the Société de Thérapeutique, that there exists pronounced antagonism between paraldehyd and strychnia. Enough strychnia to kill twenty-five rabbits was given to one of these animals, to which a large dose of paraldehyd had previously been administered, without producing death, the only symptom of the action of strychnine being a few weak convulsions. Experiments on other animals gave the same results (*Medical Press*, March 12, p. 232).

Peroxide of hydrogen is recommended in the March number of the *Practitioner* (p. 197) as a local antiseptic and astringent. The advantages which are claimed for it are that, besides being a powerful antiseptic, it is colourless, odourless, cleansing and stimulating, does not stain or corrode, destroys pus, causes no pain in its application and is not poisonous. In purulent ophthalmia, otorrhœa, gonorrhœa, leucorrhœa, ozœna and stomatitis it has been found useful, and in all forms of ulcer, especially if of syphilitic origin, it exerts a healing effect. Dr. Shelly points out that if a few drops of the ordinary 10 per cent. solution be brought in contact with pus, a brisk effervescence at once commences and continues until all the pus is completely destroyed and a stimulant action on the wound takes place, followed by healthy repair. He suggests its use as a topical application in membranous diphtheria.

Writing respecting the use of "sulphide of calcium" solution for the cure of scabies, referred to last month (see before, p. 664), Mr. Wilkinson, of Manchester, says:—"I do not know whether it is supposed to be a new method of treatment or not, but I made the very same solution five and twenty years ago for a medical man in this neighbourhood, who found it a very effectual remedy for the itch, though I think somewhat severe. His treatment was to wash the skin thoroughly with warm soap and water, then rub the lotion well in before the fire, and afterwards again wash with soap and water."

The pharmacology of the camphor group is being investigated by Dr. Pellacani, of Modena. He reports (*Arch. f. exp. Path.*, xvii., 369) that borneol and menthol in respect to the manner of their action upon the nerve system differ essentially from other members of the camphor group. Like common camphor they act chiefly upon the central organs of the nervous system, especially the spinal cord and medulla oblongata, but it is in the direction of a diminution of their sensibility and activity, and on account of this dispressing action they are thought much more suitable for administration as a calmative. Menthol especially was found to be innocuous to the vascular system and large doses of it were tolerated by animals. Brom-camphor in its physiological action showed no specific distinction from common camphor, but it acted much more powerfully upon dogs, affecting them in doses in which ordinary camphor was quite inert. Some experiments have been made with secondary alcohols derived from decomposition products of camphors in the organism. One of these, campherol, prepared by the action of hydrochloric or sulphuric acid upon campho-glycuronic acid, occurring in the urine after the ingestion of ordinary camphor, was found to manifest in small doses administered subcutaneously an action similar to that of the camphor in large doses, together with a stimulating effect upon the heart.

The demand for eucalyptus oil and eucalyptol,

based on the reputation of the products obtained from the leaves of *Eucalyptus Globulus*, has brought into commerce oils obtained from other species, which are said not to possess the same medicinal properties. However this may be, as there is a difference in their money value, it may be useful to quote from Messrs. E. Merck's circular the characters in which an oil that appears to be known in the German market as "Oleum Eucalypti australe" differs from the genuine product from *E. globulus* leaves. The genuine oil has a weak dextro-rotatory action, forms a clear solution in 90 per cent. alcohol in all proportions, does not puff when treated with iodine, turns yellowish in contact with sodium, and has a specific gravity of from 0·900 to 0·925, according as it is distilled from old or fresh leaves. The "australe" oil is strongly lævo-rotatory, only slightly soluble in 90 per cent. alcohol, puffs with iodine, is coloured red on standing with sodium, and has a specific gravity not higher than 0·860 to 0·870. The characters for *E. Globulus oil* answer for eucalyptol. The "eucalyptol puriss." has a boiling point between 170° and 173° C., a specific gravity of 0·910 to 0·920 at 15° C., and is as clear as water.

The vesicating substance obtained from the root of *Thapsia gargonica*, which is in France largely used for the preparation of plasters (see *Pharm. Journ.*, [3], ix., 143), has been submitted to an examination by F. Canzoneri, who reports (*Gazz. Chim.*, xiii., 514), that he has separated from it normal caprylic acid and two other new compounds. One of these, occurring in very small proportions, is non-nitrogenous, crystallizes in scales melting at 87° C., and in solution has a vesicating action. The other is a bibasic acid, which he has named "thapsianic acid" and represents by the formula $C_{16}H_{30}O_4$. It crystallizes from alcohol in shining scales melting at 123–124° C., and is obtained as a crystalline potassium salt upon treating the ethereal extract of the root with strong potash ley.

The artificial preparation of heliotropin (piperonal) was referred to in this Journal in connection with the Vienna exhibition. According to the *Chemiker Zeitung* (Feb. 7), the starting point is white pepper, from which the piperin is removed by extraction with alcohol, and converted into piperinate of potassium by heating it at a water-bath temperature for twenty-four hours with an equal weight of potassium hydrate and five or six parts of alcohol in a roomy retort provided with a vertical condenser. Upon cooling, the piperinate of potassium separates in shining yellowish scales, which are washed with cold alcohol, recrystallized from hot water, and when necessary decolorized by animal charcoal. The piperinate of potassium is thus obtained in nearly colourless wart-like groups of crystals, which become yellow under the influence of light. One part of this product is dissolved in forty to fifty parts of hot water, and into the hot liquid a solution of two parts of potassium permanganate is poured under continual stirring. A pasty mass is formed, which is drained and washed with hot water as long as it retains the characteristic odour of heliotropin. The united liquids are then submitted to distillation over an open fire, and from the distillate—which is fractionated because the first runnings are richest—the greater part of the piperonal separates after cooling and standing in the crystalline form; the remainder may be recovered by shaking the liquor with ether.

It was mentioned recently that Herr Ladenburg had succeeded in obtaining piperidine synthetically by treating pyridine with sodium in alcoholic solution, but the yield was at first not satisfactory. He now reports (*Berichte*, xvii., 389) that by a slight modification of the process better results have been obtained. A larger quantity of the base has been prepared so as to allow of its exact comparison with piperidine derived from piperine, and it is stated that at present the two products appear to be identical. Herr Ladenburg has also prepared in a similar way homologues of piperidine from methylpyridines and ethylpyridines derived from bone oil. One of these, γ-ethylpiperidine, has an odour resembling coniine and piperidine, which appears to confirm Professor Hofmann's opinion that coniine may be a homologue of piperidine, and for this reason the result of the investigation of propylpiperidine, with which Herr Ladenburg is now occupied, is looked for with interest. Moreover, this work will also probably remove any doubt as the nature of tropidine, the nucleus common to several Solanaceous alkaloids (*Pharm. Journ.*, [3], xii., 1049).

The occurrence of a ptomaine presenting a close resemblance to picrotoxin in its physical appearance and chemical reactions has been chronicled by Professor Giacomelli (*Zeit. öst. Apot.-Ver.*, March 1). The only reaction in which the two bodies appeared to differ was that when dissolved in water and a few drops of neutral acetate of lead solution added, upon boiling the mixture, the ptomaine remained unaltered, whilst the picrotoxin yielded a black precipitate, leaving the supernatant liquid colourless. They differed, however, entirely in physiological action. It will be remembered that the discovery of a similar body in beer some time ago, gave rise at first to the suspicion that cocculus indicus had been used, but afterwards its origin was attributed to alteration of albumenoid substances normally present in the liquor.

In fatal cases of poisoning by arsenic a yellow substance has frequently been found at periods varying from a few months to three years after interment of the body, and this colour has generally been taken for granted to be due to sulphide of arsenic. In some recent investigations as to the nature of the substance, by Dr. J. Campbell Brown and Mr. E. Davies, it has been found that the yellow pigment removed from the intestines and stomach contained no appreciable quantity of arsenic, but was readily soluble in chloroform, less so in alcohol, slightly soluble in strong ammonia, and reprecipitable by hydrochloric acid, and insoluble in water. The yellow residue obtained from the chloroform solution was reddened by strong hydrochloric acid, while nascent hydrogen from zinc and hydrochloric acid discharged the colour and dissolved the residue. Nitric acid converted it into a purple, then red, then brown substance; sulphuric acid gave a temporary red colour passing into brown. Sulphuric acid and pure sugar gave the violet-purple tint characteristic of Pettenkofer's test (*Brit. Med. Journ.*, March 15, p. 506).

In a communication to a recently-issued volume of 'Guy's Hospital Reports,' Dr. Stevenson alludes to a generally accepted opinion that water stored in zinc or zinc-coated tanks is not affected by the zinc to any appreciable extent, and states that he has abundant evidence that water does, under certain conditions, act energetically upon zinc and galvanized iron. He mentions a case in which rain water passing from

a reservoir through galvanized pipes was for many weeks turbid and milky in appearance, and contained a notable quantity of zinc in suspension and some in solution. The experience is confirmed by Mr. J.L. Wills, who in a letter to the *Chemical News* (Feb. 29, p. 103), states that having left about two litres of water standing during three weeks in a galvanized iron bucket he observed an abundant white flocculent precipitate, which, collected and dried at 100° C., weighed 3·25 grams, and consisted of an oxidized product of zinc.

Confirmation has been received of the report, referred to on a previous occasion, that the German Cholera Commission has succeeded in establishing a connection between the bacillus which had hitherto been found only in the bodies or evacuations of cholera patients and suspected water. According to a correspondent of the *Daily News* (March 26), whilst the Commission was in Calcutta a sporadic outbreak of cholera of great intensity occurred in the native quarter of the city and in the neighbourhood of a dirty tank. Upon examining water from this tank Dr. Koch and his colleagues found that it swarmed with the parasite which they had previously found associated so closely with the disease. It was ascertained that the water had been used both for drinking and bathing purposes by the people among whom the outbreak occurred, and moreover it was observed that coincidently with the subsidence of the outbreak the water became clear of the parasite. Hitherto, however, the members of the Commission have failed to demonstrate the causal activity of this bacillus by communicating through it the disease to animals; but an announcement is now made that Dr. Richards, civil surgeon of Golundo, has succeeded in communicating in this way what he believes to have been genuine cholera to a pig, which died three hours after the cholera poison had been administered.

According to a note in the *British Medical Journal* (March 8, p. 476) Dr. E. Klein has recently investigated the bacillus of jequirity, and finds that the bacillus is, of itself, quite incapable of producing ophthalmia, and, further, that the pus from a case of ophthalmia contained no trace of the bacillus. He found also that the infusion of jequirity could be rendered incapable of producing ophthalmia by boiling for a time insufficient to destroy the bacilli, and that the bacilli, when cultivated in peptone solution or jequirity infusion previously sterilized by boiling for half an hour, possessed no power of producing ophthalmia. The active principle of the jequirity appears, therefore, to resemble, to some extent, in its vital properties the pepsine ferment, in that it is easily destroyed by heat. This statement is confirmed by Mr. Arthur Benson in a subsequent number of the same Journal (p. 564), in which it is stated that he has found that ophthalmia could be produced by the freshly powdered seeds, by the freshly made infusion, by the infusion after bacilli had appeared in it, by the infusion, six weeks old, swarming with various micro-organisms, and by the infusion after the bacilli had ceased all motion and had sunk to the bottom of the liquid apparently dead. He had examined, at all stages of the disease, the discharges and membranes from eyes affected with jequirity ophthalmia without ever seeing the typical bacillus. A one in ten thousand solution of corrosive sublimate prevented bacilli from forming, but did not destroy the power of the infusion to produce ophthalmia.

Dr. Klein, in an article in the *Practitioner* (p. 185), on "Micro-organisms and Disease," states that he finds a mixture of agar agar or Japan isinglass and peptone sugar solution one of the best media for cultivating bacilli, as it is solid, beautifully limpid and an excellent nourishing material. He speaks as though agar agar and Japanese isinglass were identical; the former name is, however, given to *Eucheuma spinosa*, and a jelly obtained from it, while the Japanese isinglass is prepared chiefly, if not entirely, from another alga, *Gelidium spinosum*. Of Japanese isinglass there are several varieties, but the one used by Dr. Klein is in the shape of thin shrivelled transparent lamellæ or narrow bands, and is, he says, very difficult to obtain. The isinglass is soaked overnight in distilled water, 1 to 5 or 6, and then dissolved in a water-bath, well neutralized with carbonate of sodium, filtered and mixed with a third of its bulk of broth, peptone or beef extract solution. As a rule he prefers peptone and sugar solution containing 2 per cent. of beef peptone and 1 per cent. of cane sugar, the solution being neutralized and filtered before use.

The use of tin vessels in the preparation of syrup of violets, on the ground that a preparation having a finer blue colour is thus obtained, has not yet been satisfactorily explained. It has been recently suggested (*Pharm. Post*, March 8) that the tin acts upon the colouring matter of the violets similarly as it is known to do towards other colouring matters, combining with it to form a lake, and that it is to such a compound that a syrup of violets prepared in a tin vessel owes its comparative permanence of colour.

Herr Tschirch has published (*Pharm. Zeitung*, Mar. 15) the results of an examination made to determine the responsibility as to a parcel of vanilla which had been rejected on account of its defective appearance. In the first place the capsules were disfigured by rows of roundish or oval warts. These, upon closer examination, were found to surround minute punctures, which were concluded to have been the work of an insect before the ripening of the fruit. There was also a large quantity of dust and yellow threads, which under the microscope were resolved into the gonidia and mycelium of *Aspergillus glaucus*. In addition, live and dead mites of a species of *Tyroglyphus* were found. The presence of the fungus and mites was attributed to putrefaction, due to the pods being packed before they were sufficiently dry. It was considered, therefore, that all the defects originated before the vanilla left the Mauritius, and the award was made accordingly.

At a recent Pharmaceutical Meeting in Philadelphia, Professor Maisch alluded to the fact that the *Spigelia* commonly sold twenty-five years ago has entirely disappeared from the market, its place having been taken by the much smaller roots of *Spigelia marilandica*, and by one or more species of *Phlox*, principally *P. Carolina*. He had been informed, when in Georgia, that the reputation of *Spigelia* had been built up on the results obtained by the use of *Phlox*. Dr. Miller corroborated the statement concerning *Phlox*, saying that he had found it useful in his own family before he had made extract from it for the trade. On the lists of some dealers both true and false pink root are quoted. Professor Maisch believed that different species of *Phlox* as well as *Spigelia marilandica*

were known in the Southern States as Carolina pink, and it was possible that the root of *Phlox* might have been first used and the *Spigelia marilandica* subsequently taken its place (*Amer. Journ. Pharm.*, December, p. 631).

Professor Maisch has also pointed out that the root of *Nyssa grandidentata* is the species which is used under the name of tupelo for making tents, its wood being extremly light, while that of *Nyssa multiflora* and *uniflora*, growing in the Northern States, have a denser wood unsuited for the purpose (*Amer. Journ. Pharm.*, December, p. 632).

Those members of the community whose hobby is botany or natural history will be grateful to Professor Bryce for introducing into Parliament his Bill "to secure access to mountains and moorlands in Scotland." The Bill embodies every possible precaution against the abuse of the access wished for, and it may be hoped that the natural history societies and field clubs all over the country will use every available means to obtain for the Bill Parliamentary sanction. In many parts of the country the localities for rare plants, which are often among the most beautiful scenery of the country, are thrown open by their owners on certain days of the week, and the advantage is rarely abused and much appreciated. Still there are many places in this country and still more in Scotland, the botany of which has been very imperfectly explored, owing to the churlish refusal of the owners to admit persons, even of equal social rank with themselves, to explore their woods and uncultivated lands.

Several medicinal plants are now in bloom. In the country the tops of the elm trees may be seen to be brown with blossoms. On railway banks and waste clayey places the golden blossoms of the coltsfoot are brightening the almost bare soil. The sweet scented green flowers of the *Daphne Laureola* and the purplish ones of the *Daphne mezereum* are now in full bloom. In gardens the rosemary is in blossom, and the *Asarabacca* is just pushing its leaves through the ground. At Kew the *Atropaceæ* are represented by the *Hyoscyamus orientalis*, a valuable plant for botanic gardens, since it flowers at a time when it is difficult to procure specimens of that natural order. At the Royal Botanic Gardens at Regent's Park the Coca plant is now in full bloom. Among our rarer wild plants *Lathræa squamaria* is now emerging from the ground, and its white scape is so unlike any other plant met with at this time of year that it can hardly be overlooked. Further, Mr. Lynch, of the Cambridge Botanic Garden, sends word that the pretty *Muscari racemosum* and *Anemone Pulsatilla*, which grow wild near Cambridge, are now coming into blossom. At the time of writing, a specimen of *Salex Caprœa* with several stamens on a female spike has been brought in from Epping Forest, an occurrence which seems to be very rare.

Another new British plant, *Juncus tenuis*, Willd., has recently been detected at Cradley, in Herefordshire, by Mr. R. F. Towndrow. According to a short note in the *Journal of Botany* (p. 91), the plant is interesting as being probably identical with a plant found by Mr. G. Don, in 1795 or 1796, by the side of a rivulet in marshy ground among the mountains of Angusshire, but very rare; it was described at the time in 'English Botany,' 1st ed., as *Juncus gracilis*, and figured under the name of *J. Gesneri*, DC., and in the second edition figured as *J. Gesneri*, while *J. gracilis* and *J. tenuis* are given as synonyms. The rare little plant, *Erythræa capitata*, var. *sphærocephala*, has also been detected by Mr. W. Matthews, in Guernsey, probably on L'Ancresse Common.

According to a note in the *British Medical Journal* (March 1, p. 428), Professor Virchow recently exhibited at a meeting of the Berlin Medical Society photographs of a gigantic plane tree growing in the Island of Cos, under the shade of which Hippocrates is said, by tradition, to have held medical consultations. The tree now stands in the market place of Cos on the east side of the island. The branches, which spread over nearly the whole of the market place, are supported by marble pillars.

The *Gardeners' Chronicle* (March 22, p. 373) publishes a letter from M. Alphonse de Candolle on a botanical point of some little interest. The names of varieties of plants are usually written in the same gender as the generic name, thus:—*Thymus Serpyllum*, *β. montanus*, Benth., while sometimes the varieties are put in the feminine gender. Mons. de Candolle considers that if the word var. be used, representing the feminine Latin word *varietas*, the name of the variety will be more correctly written with the feminine termination. He recommends the use of a feminine termination for the varietal name in all cases, whether the var. or *varietas* be expressed or understood.

One of the seeds (*Spergula arvensis*) which is found largely mixed in foreign linseed, especially in Russian varieties, appears to be likely to have some value in agriculture. Lord Walsingham has recently cultivated on twenty acres of blowing sands, useless for other crops, a quantity of the plant, which yielded an ensilage, preferred by cattle to that made from grass. The plant is also said to be valuable food for poultry. Since the seed may be obtained as a waste product by the sifting of linseed, it may be hoped that the demand likely to arise for it through this observation may lead indirectly to greater purity in commercial linseed.

Dr. Dymock, in the recently concluded 'Vegetable Materia Medica of Western India,' points out the curious fact that camphor is resublimed in India, not so much with a view to its purification as to increase its weight by getting as much interstitial water as possible into the cake. In order not to lose the profit thus obtained, the camphor is sold as soon as possible after sublimation at the same price as the crude article, the profit being thus drawn out of the water.

A case of poisoning by hemlock is reported in the *British Medical Journal* (March 22, p. 576), which occurred during the previous week to some boys belonging to the training ship *Cumberland*, stationed on the Clyde. Ten of the boys became seriously ill, the chief symptom being great stupor and loss of power in the limbs. It is to be regretted that the botanical name of the plant was not reported, all that is said being that "an examination of the herb showed that it belonged to the *Umbelliferæ*, and was one of the hemlock species." The plant most likely to have occurred on wet streamlets near the shore is *Œnanthe crocata*, and it is also the plant whose tuberous roots are most likely to have been eaten. In the interests of toxicology it is important that this plant, the hemlock water dropwort, should be carefully distinguished from the true hemlock (*Conium maculatum*), and the water hemlock (*Cicuta virosa*).

An observation that is claimed to have a bearing

on the flora of the carboniferous period and the formation of petroleum is put on record by Dr. A. B. Griffiths (*Chem. News*, Feb. 29), who states that he has ascertained that phenol exists in various proportions in the free state in the leaves, stem and cones of *Pinus sylvestris*. Dr. Griffiths suggests that as phenol is also a product of the distillation of coal, this observation confirms the views of those geologists who date the existence of the Coniferæ as far back as the carboniferous period, and that further it also supports the theory that the origin of petroleum in nature was the action of moderate heat on coal or similar matter of a vegetable origin, since it is known that petroleum contains phenol and its homologues.

In a letter addressed to Sir William Thomson and sent by him to *Nature* (March 20, p. 494), attention is directed by the writer of the letter, Mr. L. P. Muirhead, to the quantity of meteoric dust that fell in Scotland on March 1, which he has calculated as amounting, over the area of 810 square miles, on which it was observed, to 5760 tons, or at the rate of 4 grains to the square foot. Curiously enough on the two succeeding days the goats suffered from influenza, and Mr. Muirhead himself had a sharp attack followed by a severe headache for a day. The coincidence, if nothing more, is a suggestive hint as to the cause of the epidemics of influenza that are occasionally recorded.

NOTES ON TINCTURE OF HYOSCYAMUS.*

BY WILLIAM GILMOUR.

Some time ago I had a sample of tincture of hyoscyamus given me to examine, which had a peculiar odour not at all characteristic of this tincture, and which also gave on the addition of water a milkiness much more decided than anything I had ever previously observed with hyoscyamus. It is sometimes not easy to distinguish a familiar odour if cunningly masked, but here there was little difficulty, particularly on diluting the tincture with water, in discovering the all-pervading odour of balsam of copaivi, and the supposition was that the hyoscyamus leaves from which the tincture had been prepared were annual leaves and had been sophisticated with the balsam so as to give the heavy odour and the milky opacity on the addition of water, characteristic of a tincture prepared from the biennial leaves. The idea was an ingenious one, particularly if we bear in mind that the annual hyoscyamus can at present be bought for as many pence as the biennial costs shillings. Unfortunately for the idea, the contamination was ultimately discovered to be accidental, but to this accident you are indebted for the following short notes.

There have been only two methods proposed, so far as I am aware, to distinguish a tincture prepared from the annual henbane leaves from one prepared as officially directed from the biennial, namely, that of the spectroscope, by the late Mr. Stoddart, and that of a milky opacity on the addition of water, by Mr. Donovan.

In the *Medical Press and Circular*, of 1871, Mr. Donovan directs "a little of the tincture to be added to a glass of water, when if the mixture becomes slightly milky the tincture (he states) is made from a two years old plant, but if it remain transparent the plant has been in its first year." Regarding the first mentioned test, Mr. Stoddart (in vol. xi., [2], *Pharmaceutical Journal*, 1869–70,) after describing the spectrum of the biennial tincture, which gives four very dark bands, goes on to remark of the tincture prepared from the annual plant, "This spectrum is very different to the last and cannot be mistaken for it. The chlorophyll line at B. is not so decided, the second and third lines so weak as to be barely visible and the fourth absent." A year later, writing in the same journal on Bristol Pharmacology, he puts the statement even more strongly, thus, "Authors have been undecided as to whether the biennial and annual plants should be regarded as distinct varieties, or the latter only a more mature growth of the former. The latter is probably the true state of the case. . . . . The microspectroscope will immediately decide whether the tincture has been made from the biennial plant. Five dark bands are distinctly seen which are not visible in that from the annual." Both tests, I may state, have been repeatedly quoted since as authoritative. Thus, so recently as vol. viii. of the present series, we have the writer of the Month article, in the *Pharmaceutical Journal*, making reference to both and saying that "practical pharmacists should not forget that the tincture of this plant (annual) does not show a milkiness when mixed with water, as that made from the biennial does, nor that the preparation made from the two kinds can be distinguished, as shown by Stoddart, by means of the spectroscope." Now it is not easy for investigators to arrive at any definite conclusion as to what is meant *commercially* by annual henbane. I find that the term applies indiscriminately to leaves derived from a variety of sources. Thus we have the British annual henbane proper; and the root leaves of the biennial plant, which Mr. Holmes informs me usually forms the annual of English commerce; then there is what is known as German henbane, and probably a whole variety known somewhat vaguely as exotic henbane. Through the kindness and courtesy of Mr. Holmes, of the Museum department of the Society in London, I received samples of different kinds of henbane (samples of these as well as tinctures prepared from them are on the table and may be examined by members), and among others, one sample of the real German annual. I am persuaded, after comparing somewhat minutely this sample with those of the commercial received by favour from various wholesale houses, that very much of the annual henbane at present in circulation is of German origin. Be this as it may what we, as practical pharmacists, have to do is to accept and judge matters as we actually find them, and, therefore, I have to point out that of all the annual specimens which I have examined, I have not found one which did not give a spectrum as well defined as that derived from any specimen of the biennial plant. Indeed, I have found the bands of the spectrum more uniform and more decided from the various specimens of the annual plant which I have examined, than I have found from an equal number of specimens of the biennial plant. We must, therefore, once for all give up the spectroscope as an agent for distinguishing the one from the other.

It is probably not in the power of every one to apply a spectroscope to his tincture, but I will here shortly describe how a rough but very fair tes

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, March 19, 1884.

may be applied to this tincture, showing its age, quality, etc., without going to the expense of a spectroscope.

To two parts of tincture in a test tube, add one part ordinary commercial benzole; shake thoroughly and allow to stand for a short time. The benzole will be found to separate, taking with it almost every particle of green colouring matter, leaving after a time a clear tincture beneath. So thoroughly does the benzole extract the chlorophyll that it leaves scarcely the trace of a dark band in the tincture beneath, and from the depth of the green solution above as well as from the colour of the brown tincture below as good an indication will be given of the value of the tincture as can be got almost from the spectroscope itself. I have here a whole series of test tubes filled with tinctures thus treated, and, as can be seen at once, the shades of colour vary considerably, both in the chlorophyll solution above and in the tincture beneath. The history of these different tinctures will be referred to immediately, but I would in the meantime call attention to test tube numbered 3, which contains the tincture of German annual received from Mr. Holmes and which you will find not the least marked both as regards the chlorophyll solution above and the brown tincture beneath. So much for the spectroscope as discriminating between a tincture prepared from the annual and biennial plants.

Coming now to the other test, namely, that of the milky opacity on the addition of water, I have not found one single sample of biennial which failed to give it, nor can I recollect of ever coming across such a sample during the last eight or ten years in the ordinary course of business. I would, therefore, unhesitatingly reject as bad, owing to age, or from some defect in drying or from exposure, or other cause, any biennial plant the tincture from which failed to yield it. In saying this, however, I am saying all that can be said for this test. It is *not* a test which can distinguish the biennial tincture from the annual, for I have come across as many specimens of the latter which do give the milkiness as of those which fail to give it. Of those which give the milkiness, some give it at once, while others only give it after standing for some time. This last fact may be the reason why the reaction has not been more frequently observed. The tincture from the German annual, which we have here, for example, gives it readily and copiously, and, in every respect as well, answers all the tests of a good biennial spemen, with the exception of the odour. Probably most will have noticed the heavy fetid odour (not unlike ox-gall) which the biennial tincture gives on the addition of caustic potash. This peculiar odour is almost entirely wanting in every specimen of tincture prepared from the annual plant which I have examined, the odour being quite different. In this respect the sample of the annual on the table closely resembles the tincture prepared from the large stem leaves of the biennial sample received from Mr. Holmes. This sample makes a very inferior tincture and is not for a moment to be compared to the tincture prepared from the leafy tops received also from Mr. Holmes.

It was originally my intention to have confined my notes to the two points touched upon, but after proceeding with the examination of the different specimens placed at my disposal, my attention was directed to a paper read by Mr. Gerrard, at the last meeting of the Pharmaceutical Conference, on "The Odorous Principle of Henbane Leaf." In a concluding note to this paper, in which Mr. Gerrard practically applies his investigations to pharmacy, he points out not only what I have just shown as regards the turbidity test, but goes on also to deduce several conclusions from it which, according to my experience, will, I think, scarcely stand the test of experiment. He states for example that "many samples of tincture of henbane almost lose their property of becoming turbid with water; this is generally the result of age, for such a tincture will be found to have lost its original green colour and changed to a brown with formation of the usual dark deposit. Thus deposition and disappearance of turbidity are simultaneous and proportionate. As to the nature of the deposit in the tincture, I believe if examined it will be found to consist of a mixture of odorous principle, fat and chlorophyll, the separation of which is slowly effected by the agency of the water in the proof spirit; if this be so, then it is an argument for the use of a stronger alcohol in the making of the tincture of henbane."

I called Mr. Gerrard's attention to the fact that I had exposed a tincture of henbane to ordinary light (no sunshine), and in three weeks it had lost almost every trace of green colouring principle, while it had not deposited in the least, nor had it lost its property of becoming turbid with water. To this Mr. Gerrard replied that the tincture had not been kept sufficiently long, but that with the changing of the chlorophyll the tincture would have become acid (it shows no signs of acidity up to the present time), this acidity increasing with age, and that the deposit referred to by him would take from three to six months to form. I believe Mr. Gerrard is quite right in his observations, although I think he is wrong in his deduction that this change is "slowly effected by the agency of the water in the proof spirit." Some years ago I pointed out that these very changes here described by Mr. Gerrard took place in olive oil on exposing it to light. There was first the gradual decomposition of the chlorophyll and the disappearance of the bands in the spectroscope; next, an increasing cloudiness in the oil, accompanied by an increasing acidity, all of which, I have no doubt, would have ended in a deposit as described by Mr. Gerrard had the density of the oil permitted this, or had it been kept long enough. The water could scarcely in this instance be said to be the agent which either favoured decomposition or tended to effect separation. But further and more important still, I have to point out the much greater susceptibility of a tincture of henbane to change when prepared with a stronger as compared with a weaker alcohol. I have prepared duplicate tinctures with rectified spirit of every sample of henbane on the table, and two things cannot fail at once to strike even an ordinary observer regarding them, namely, first, the close resemblance which they all (annual and biennial) bear to each other, and, second, the striking unlikeness which they have to a tincture prepared from proof spirit. They have all the same deep green coloration, not unlike essence of bergamot, or better still, like commercial cajeput oil, and this characteristic feature, so striking in the first instance, is equally remarkable for its evanescence on exposure. I find that even twelve hours exposure will quite change their appearance, and this change goes on so rapidly that towards the end

of a week the tincture becomes almost decolorized. I have here two tinctures thus exposed, which you can compare with samples of the same tincture carefully preserved. Twelve hours' exposure removed every trace of bright green, converting the tincture into a brown olive, and this in turn gradually faded, until it reached on the seventh day the dirty straw-white which you now see. This you will admit is of itself a very serious objection to any change in the spirit strength of the tincture, more especially if we keep in mind, comparatively speaking, the permanent character (to the naked eye) of the official tincture, three weeks exposure under similar conditions making scarcely any observable difference in it.

There is still one more objection to changing the spirit strength of this tincture, and to my mind it is the most serious of all, namely, that the stronger spirit does not exhaust the leaves of their active principle. In saying this I know that I am going not only in the face of Mr. Gerrard, but also of such an eminent authority as Christison, who says that the leaves impart their active principle alike to alcohol and proof spirit. From the very great change which has taken place in the rectified spirit tincture on exposure, as well as from the entire absence of any colouring principle except the chlorophyll when treated with benzole as already described (on agitating the rectified spirit tincture with water and benzole, the benzole extracts every particle of green colouring matter and leaves the tincture beneath absolutely colourless), I think there is every reason to conclude that the stronger alcohol exhausts the leaves to a very great extent of their green colouring matter and not to any extent of their active principle. In further proof of this I have to point out that with wonderful uniformity all the proof spirit tinctures contain from five to six times the amount of extractive matter compared with the stronger spirit tinctures prepared from the same samples. The table underneath sufficiently explains itself.

No. 1. German annnal, proof spt. = 1·05 per cent. extractive.

No. 2. German annual, rect. spt. = ·20 per cent. extractive.

No. 3. Large leaf biennial *ver.*, proof spt. = 1·40 per cent. extractive.

No. 4. Large leaf biennial *ver.*, rect. spt. = ·20 per cent. extractive.

No. 5. Biennial tops *ver.*, proof spt. = 1·40 per cent. extractive.

No. 6. Biennial tops *ver.*, rect. spt. = ·20 per cent. extractive.

No. 7. Biennial commercial (1), proof spt. = 1·20 per cent. extractive.

No. 8. Biennial commercial, rect. spt. = ·21 per cent. extractive.

No. 9. Biennial commercial (2), proof spt. = 1·20 per cent. extractive.

No. 10. Biennial commercial, rect. spt. = ·5 per cent. extractive.

Of course extractive matter is not active principle, and the correct plan to determine the relative value of the two tinctures would be to estimate the amount of hyoscyamine present in them. I have been experimenting on quantities much too small to permit of this, and, moreover, it was not my intention, as I have already explained, to enter into the question of a stronger or a weaker tincture, so that I have not had time to do so, even although I had so desired.

To sum up my observations, we have—

First. The fact that the spectroscope does *not* distinguish between a tincture made from an annual or a biennial plant.

Second. That the milky turbidity on the addition of water is not a test to distinguish the one from the other; but it is a fairly good test as to the quality, so far as age, exposure, etc., of the biennial plant is concerned.

Third. That a proof spirit tincture, although quickly changing so far as the chlorophyll matter is concerned, does not show this change to any extent to the naked eye, while the more important chemical changes which ultimately affect the quality of the tincture therapeutically are comparatively slow.

Fourth. That a rectified spirit tincture undergoes very rapid changes, which are very conspicuous to the naked eye, and which are almost certain to end in rapid chemical changes affecting the therapeutic value (if it possesses any) of the tincture.

Fifth. That rectified spirit does not possess the same power of exhausting the henbane of its extractive matter as proof spirit.

Sixth. That a rectified spirit tincture and a proof spirit tincture are quite unlike in their appearance, so much so as practically to make them unrecognizable.

[*The discussion on this paper is printed on p.* 790.]

NOTES ON PHARMACEUTICAL APPARATUS.*

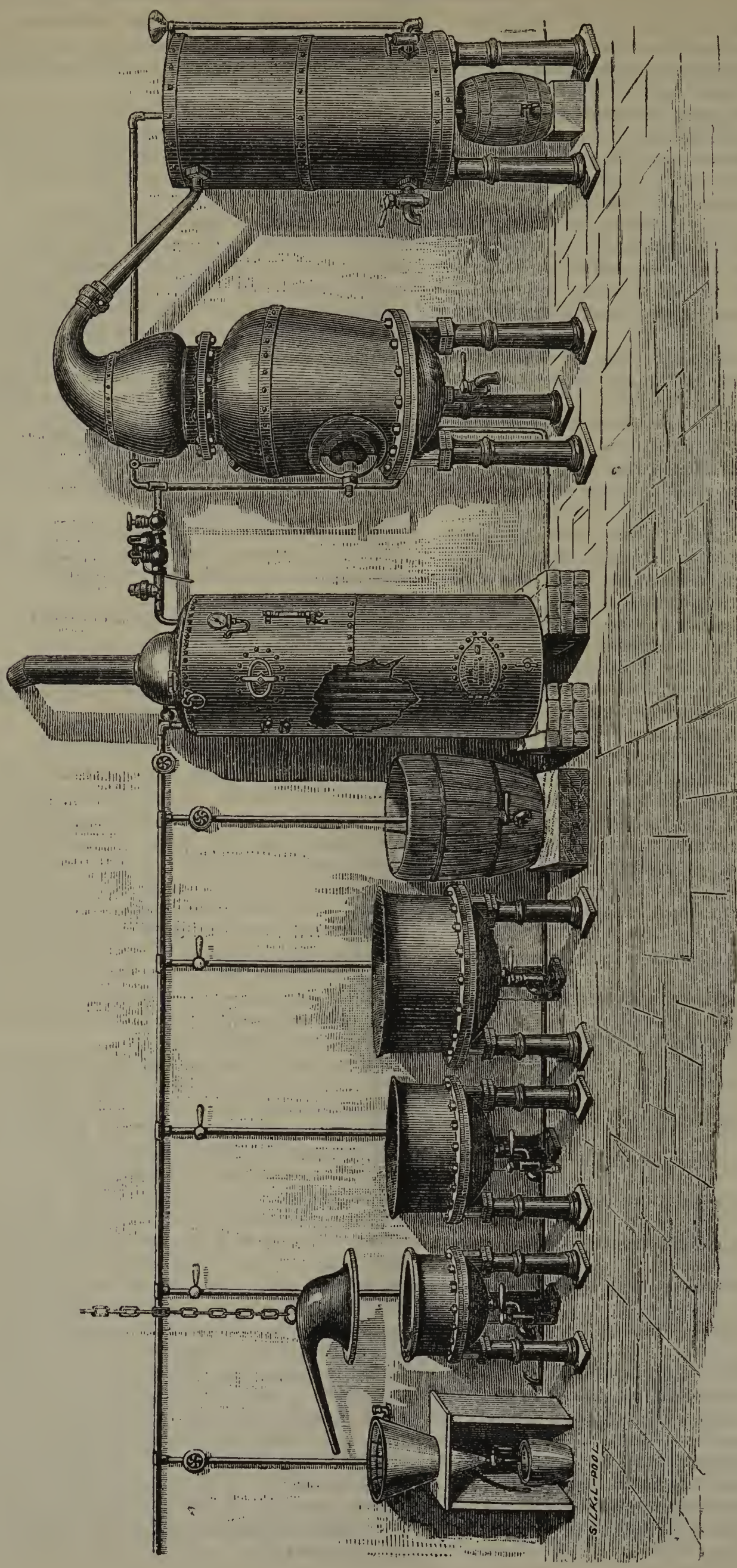
BY CHARLES SYMES, PH.D.

Some years ago, Mr. Ince (I believe it was Mr. Ince) wrote thus, or to this effect, "I have a good deal of faith in a man and a pan, provided the one has brains and the other has capacity." These words forcibly conveyed to my mind, that, in the opinion of the writer, a man of good average intelligence, with simple apparatus, sufficiently large for his purposes, could accomplish much in the way of manufacturing pharmaceutical preparations; and I think there can be little doubt that a pharmaceutical sermon, having "a man and a pan" for a text could, in able hands, be rendered both interesting and instructive.

As a busy man, having my time pretty fully occupied with the duties of my calling I merely propose to bring before you this evening some ideas concerning, and description of, a few simple but useful forms of pharmaceutical apparatus. I do so under the following circumstances.

Last year a friend from South America, when visiting Liverpool, desired to see our laboratory, about which he had probably formed some exalted notions; but on being shown the very modest equipment, after some conversation he said, "If so much practical work can be accomplished by such simple means, send me some similar things, such as your experience suggests as being necessary and useful to commence with for a small laboratory, and to which I can add as occasion requires." The work (except percolators, retorts, and minor matters) was, with rough drawings, placed in the hands of Messrs. Thomas Ryder and Co., engineers, of Manchester, and was by them executed in a highly satisfactory manner. I may add that as the apparatus

* Read at a meeting of the Liverpool Chemists' Association, February 28.



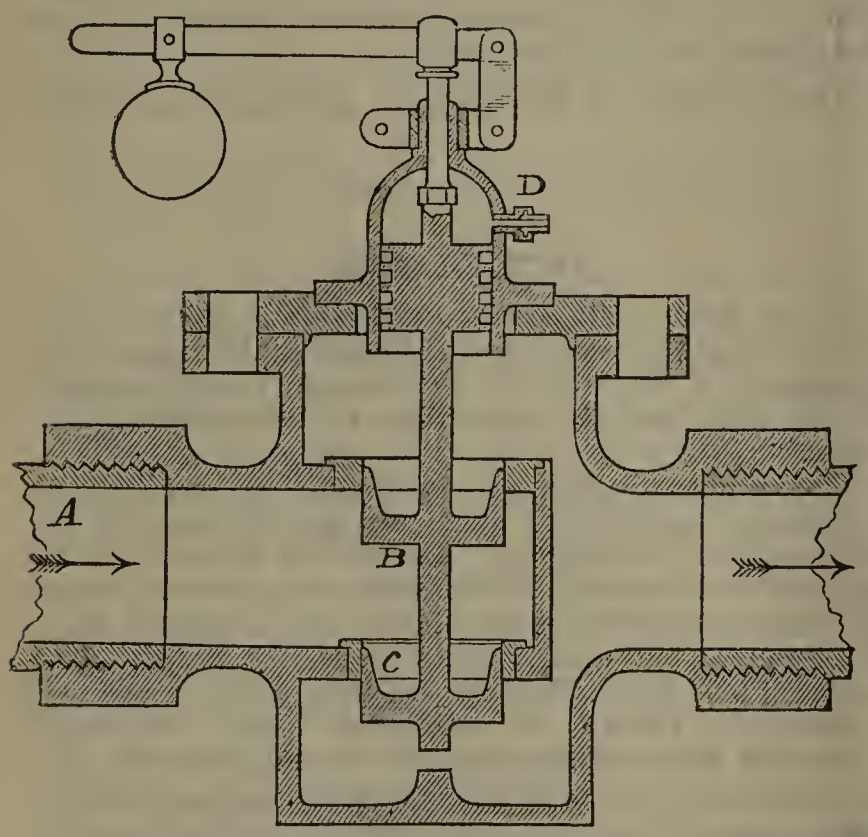
Pharmaceutical Apparatus.

As constructed by Messrs. T. T. Ryder and Co., Manchester, for Messrs. Symes and Co., Liverpool.

The boiler has been introduced to show the working position.

had been shipped long before it occurred to me to write this communication, I am indebted to them for a photograph and some particulars to refresh my memory and enable me to bring the matter before you in what I trust will be a clear and explicit manner.

I must mention that our friend had already a high pressure boiler working an engine and other machinery, and we had, therefore, to start with a reducing valve.



This valve is made of gun metal and is so arranged on the steam supply main that it reduces the pressure therein from the actual pressure of the boiler, say 60 lbs., to 2 or more pounds per square inch, as may be desired.

The steam entering at A, and acting equally on the two valve faces B and C, it will be seen that there would be no passage but for the lever, which is weighted in such a manner as to allow just sufficient steam to pass through to produce the lower pressure and temperature. To the small union connection, marked D, is attached a brass tube to convey away any moisture from the upper chamber which may accumulate by the condensation of steam as it is passing through the valve; and it also serves to prevent the possibilty of a vacuum being formed which would hold the valves in check and prevent them from working freely.

As most pharmacists would provide a boiler specially for working such apparatus I am about to describe, let me say a few words about boilers, the choice of one being a matter of some importance. Our own is a small upright tubular, 4½ feet high by 26 inches diameter; it stands on nine inches of brick-work, and occupies but little space in the laboratory. An iron pipe, covered with felt to lessen condensation, runs from it round two walls of the building to supply steam to stills, pans, funnels, etc.

To have a boiler too small for the purposes required is a decided mistake; it is better to err in the opposite direction, as anyone with experience in these matters will know how trying it is to run short of steam when two or three preparations are in hand and a lot of evaporation has to be done. There is of course a limit in size, beyond which it is not desirable to go, first on account of space, and secondly on the score of economy in time and fuel, for if a much larger boiler is used than is really required there is so much more water to be heated each morning at the expense of these two items.

Boilers are usually described as of one or more "horse power," and to obtain this unit in the most simple form the following conditions are necessary, viz., 1 square foot of fire grate and 1 square yard of heating surface; these, with an expenditure of 14 lbs. of coal evaporate 1 cubic foot, or rather more that six gallons of water per hour, which, in the form of steam applied to a Boulton-Watt engine would perform the work of one horse for that period of time. A two horse boiler is sufficiently large where machinery is not used, and an upright tubular one is the best for "getting up steam" quickly. In this, coke should be used in preference to coal, as the latter is liable to choke the tubes with soot very readily. Although it should be tested to bear a pressure of at least 100 lbs. to the square inch, not one tenth this amount is generally used for pharmaceutical purposes.

With a low pressure boiler, then, a reducing valve is not required, and the steam is taken direct from it to the point at which it has to be used, merely interposing a screw stop valve on the main, which in such position is better than an ordinary tap, as it affords a more convenient means of regulating the supply. In the arrangement shown, a tub, three pans and a funnel are placed on one side of the boiler; a still and condenser on the other side. Into the tub passes a block tin pipe, terminating on the bottom in a flat perforated coil; a short distance above which, rests a perforated false bottom, such an arrangement being convenient for steaming and boiling purposes, where the ingredients are bulky, as in the case of decoctum sarzæ comp., etc.

The pans are of copper, jacketted with cast iron, leaving a steam cavity over the lower part only. This provides sufficient heating surface for rapid evaporation, and avoids to some extent the inconvenience and possible deterioration of the product caused by the drying which always occurs on the outer edge of the liquid where it comes in contact with the sides of the pan when it is jacketted to the top. Constant stirring will of course obviate this to some extent, but even with this, and the old arrangement, it is not easy to remove the difficulty.

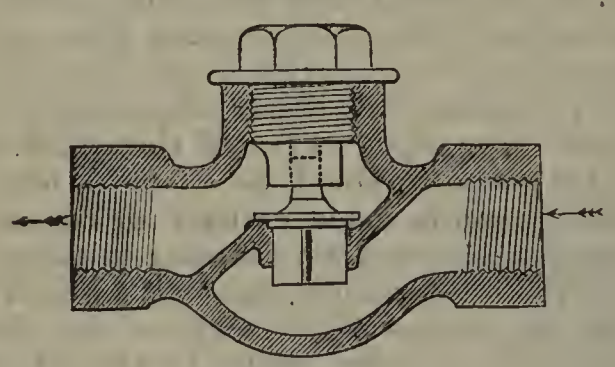
The capacities are 40, 20 and 10 gallons, and the internal measurement, 30 × 24, 24 × 20 and 18 × 17 in. respectively, and such a one is fitted with a check valve, or tap, vacuum valve, and a syphon pipe and back pressure valve at the outlet for waste steam; it is self-contained, requiring only the attachment of the steam supply and waste pipes, so that if thought desirable, the relative positions could be changed with ease. The steam funnel is made entirely of copper, well tinned inside, and the steam chamber is continued to the top. The steam supply enters at a ⅜-inch union near the top, makes the circuit of the chamber and passes out at right angles to the side of the funnel, more or less condensed, near the bottom. The exit tap is somewhat large in proportion to the funnel itself, the object of so having it being to prevent any possibility of choking up and to provide a good exit for any thick or partly solid filtrate. The interior of the funnel is fitted with a tinned wire cagework which can be removed at will, its obvious use being to prevent the filtering material from touching the sides of the funnel and for preserving

a clear passage for the filtrate in all directions, whilst the support given is practically equal to that by a solid surface. Near the top is placed a small safety valve which is regulated to blow off at 5 lbs. pressure. The main steam pipe (if not required for drying closet) should terminate in this direction with a T-piece, fitted with screw tap and hose connection, so that a rubber tube can be attached when desired; it is useful for many purposes, one example is that of steaming nux vomica beans before grinding.

The still is placed on the opposite side of the boiler; it is of copper with a cast iron jacket, similar to those on the pans, and has fittings like them. In the body of the still is a gun-metal hand-hole for removing any solid residue and for cleaning out purposes. It is also fitted with a removable perforated false bottom for separating any solid matter from the liquid contents drawn off by the tap underneath. The distillate is condensed in a block tin worm contained in a circular wrought iron cistern of 60 gallons capacity, the exit being from the side near the bottom.

Passing direct from the boiler is a steam-pipe which terminates in another block tin worm at the top of the cistern, going within the coil of the other worm and out at the centre of the bottom of the cistern. Underneath is a stoneware barrel to receive the distilled water as it flows from the last-named worm. This is found to be a convenient arrangement, and whenever the pressure is increasing unduly round the still or pans, or when it is necessary to stop the working of one or more of these, then the distilled water tap can be turned on, with the result that one has a good supply of distilled water, practically free of cost.

It has been mentioned that each pan is fitted with a syphon pipe and back pressure valve. The former prevents waste of steam, and consequent power; a foot of condensed water in the pipe would represent approximately half a pound of steam pressure. The latter prevents the waste steam from one pan from entering the chamber of the next, replacing a tap and acting automatically; it is exceedingly simple, as will be seen from the drawing. The arrows indicate the direction in which the steam (or condensed water) passes, lifting the small valve in the centre and moving forward freely; but if it attempts to pass in the opposite direction, the more tightly the valve is closed against it.



The apparatus described does not by any means constitute the equipment of a pharmaceutical laboratory, but it forms some of the essentials for every-day work, and a foundation on which to build. The capabilities are but moderate, still the expense is moderate also. The cost, exclusive of main supply and waste steam pipes, the tub and stone barrel, is £110. A two horse upright tubular boiler costs £28 or £30, so that the whole could be fitted up for something like £150. The still, pans and funnel are tested by hydraulic pressure to bear 20 lbs. on each square inch of surface.

Doubtless, different pharmacists work their apparatus at different degrees of pressure. My experience is that with pans of the size mentioned a pressure of from 2 lbs. to 5 lbs. to the square inch, giving a temperature of from 216° to 225½° F., is the most suitable when stirring is actively continued, and when not stirring, a nominal pressure, say of ½ lb. to the square inch is quite ample.

[*The discussion on this paper is printed at p.* 790.]

NETTLE-FIBRE.

In the *Deutsche Allgemeine Polytechnische Zeitung*, Dr. J. Moeller gives a report of experiments on the histological characters of the fibre of the common stinging-nettle, *Urtica dioica*, and its applicability to technological purposes.

The primary bast-bundles of the stem do not form a connected ring, and its fibres are mostly separated by intermediate parenchyma. The cortical parenchyma is not sclerenchymatous. At the base of the stem the fibres are mostly about 0·12 mm. in diameter; higher up they are thinner; but even at the summit they have a diameter of 0·04 mm. The thinnest fibres of the nettle are therefore as thick as the thickest of hemp. In consequence of their isolation they are seldom polygonal. At the commencement of the time of flowering the fibres in the upper portion of the stem only are completely thickened; those in the lower part have still large cavities. There are no pore-canals. Fibres were measured 22 mm. in length; they are very irregular in form. They consist of nearly pure cellulose; their behaviour with cuoxam is characteristic. They swell with extraordinary rapidity from without inwards; a sharply differentiated internal layer resists the action for some minutes; but this is also at length dissolved; and in addition to a small quantity of contents of the fibres a delicate network remains, the primary membranes of the parenchyma cells which surrounded the fibres.

Fibres baked or treated with acids or alcohol show two peculiarities. They are very irregularly isolated, being either united into bands or disintegrated into separate fibres; there are no thin bundles, like those of combed flax or hemp. This peculiarity depends on the structure of the primary and on the want of secondary bast-fibre-bundles. The second peculiarity is their complete and nearly regular investment with parenchyma, in consequence of which they are rough and dull; resulting from the incomplete differentiation of the wall of the fibres and of that of the parenchyma-cells.

Both these peculiarities are very disadvantageous to the employment of the nettle-fibre as a technical product. The chemical means employed to separate the fibres completely from the surrounding parenchyma would affect injuriously the fineness of the fibre.

Attempts have been made to naturalize in Germany the North American *Laportea pustulata*; but similar disadvantages attend the structure of the fibre. In August the bast-fibres in the upper third of the stem are not yet developed; in the lower portion they are but imperfectly thickened. The cortex, bast and fibres, resemble those of *Urtica dioica*; but the fibres are considerably larger at the base of the stem, usually 0·5 mm. in diameter, and more than 80 mm. long; in the middle part of the stem they have still a diameter of 0·1 mm. They consist of pure cellulose; they dissolve rapidly and completely in cuoxam, leaving behind a parenchymatous network and the protoplasmic contents of the fibres.

The Pharmaceutical Journal.

SATURDAY, MARCH 29, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PROPOSED LEGISLATION AS TO POISONS.

THE past week has not been without its history, for on Wednesday, Mr. WARTON's exceptional effort at constructional legislation,—the Bill to Restrict the Sale of Patent Medicines—was withdrawn, after a brief public existence of only seven days. This result was not unexpected in view of the declaration of the Government as to its intention to deal with the poison question, and little ingenuity was required to anticipate the tenour of the greater part of the discussion attending the withdrawal in the House of Commons, which will be found on another page. The member for Bridport is evidently strongly impressed with the evils consequent upon the unrestricted sale of poisons under the guise of patent medicines, and the measure proposed by him for diminishing them can hardly be said to have been wanting—in intention, at least—in stringency. Whether the provisions would have proved workable is quite another affair, and notwithstanding the high compliment to the Pharmaceutical Society implied in the willingness of the honourable member to entrust it with the onerous—and honorary—duty of carrying them into effect, it is not probable that the collapse of the proposed arrangement will arouse much regret in that quarter. Nevertheless, Mr. WARTON did good service in impressing upon the attention of the Legislature the fact that the very same poisons that it has decided shall not be sold in an undisguised form except by skilled persons and under certain restrictions, are being sold under the cover of the patent medicine stamp by any persons and without any precautions. Moreover, he very properly pointed out that the makers of innocuous preparations would have no difficulty in placing them outside the operation of the proposed law. In connection with this latter point it is rather curious—though under the circumstances perhaps hardly worth noticing—that such a high authority as the Attorney-General appeared to be imperfectly acquainted with the actual provisions of the Bill that he was discussing. In order to enforce his argument, he said that according to the Bill, if, on analysis, one trace of poison, however slight, should be found in a preparation, notwithstanding the medicine might be of a beneficial character, it must be labelled poison and the sale of it must be regulated by all the forms prescribed by the Pharmacy Act. Now apart from the fact that this appears to be a reversal of the order of the Bill, according to which a patent medicine was to be considered a poison until it had been declared non-poisonous, a reference to the second clause will show that the provision as to the Pharmaceutical Society passing a resolution to the effect that a patent medicine contained poison would have been permissive in its terms, and that even in the event of such a resolution being passed it would have required the sanction of the Privy Council before coming into force, a not unimportant limitation.

Dr. FARQUHARSON, who, from the fact that his name was on the back of the Bill, might have been expected to bless it rather than to ban it, did not betray any excessive admiration for some of its provisions. His view that an authoritative declaration, based on analysis, such as was proposed, would increase the tendency of the public, already imparted by the revenue stamp, to look upon such medicines as bearing a Government sanction, is no doubt correct. Indeed his suggestion that the Government should sacrifice the sum derived from the patent medicine stamp duty will probably commend itself to most persons who have considered the subject apart from the necessities of the public revenue. It is satisfactory to observe, however, that although it was outside the scope of the Bill under discussion, Dr. FARQUHARSON's appeal to the Government to consider the anomalous liberty at present allowed to co-operative stores in respect to dealing in poisons was endorsed by the approval of his hearers.

The arguments for the rejection of the Bill were of two kinds. That by Mr. W. JAMES was advanced from the point of view from which the Bill would naturally be regarded by persons interested in the patent medicine traffic. No doubt regulations dealing with the question in any way will constitute an interference with trade and will exercise a limiting influence in direct proportion as the nostrums to which they apply contain those substances that are supposed to exercise a deleterious influence upon the public health. But the emphasizing of the enormous proportions of the traffic and the extent to which it would be affected by restrictions imposed in the interest of the public will hardly be accepted as a reason that nothing should be done to control it. Moreover, in the face of well-known official statistics that had already been referred to in the course of the discussion, it seemed barely courteous to the House to assert that during the last two years not more than seven deaths had occurred through poisoning by patent medicines. No serious discussion could be maintained on the basis of such a statement. The reason urged by the Attorney-General for the rejection of the Bill, that the Government is prepared to deal with the question in a broader sense, was much more reasonable, and probably Mr. WARTON will consider that his object has been sufficiently attained in eliciting a definite statement

as to the introduction of a Government Bill. In conclusion, we may remark that in referring to this subject recently, we ventured to express an opinion as to its unsuitability for treatment by "amateur legislators," and, although members of parliament were hardly the class to whom it was intended to allude, this latest episode in the poison controversy seems to show that even that further application of our remark would not be unwarranted.

THE PROGRESS OF METEOROLOGY.

The annual Report of the Meteorological Council to the Royal Society, which makes its appearance about this period of the year, is usually more suggestive of an enormous amount of investigation that remains yet to be undertaken than of any very marked progress in acquired knowledge of the science. This is attributable, however, rather to the *laches* of the past than to want of energy amongst present investigators, though the infinite extent and variety of the field wherein the work has to be done is apt to bewilder the uninitiated as to the object towards which all this effort is tending. In fact, observations continuous and ubiquitous are at present of prime importance, in order to provide the material from which future generalizations shall educe the laws, if there are any sufficiently apparent, that affect the rule of sunshine or of storm. The ambition of the meteorologist is far-reaching, and in this fact there is justification for the hope that the service that will be eventually rendered to mankind by his science will be great. Whether it ever will be possible to prognosticate trustworthily as so the character of a coming season, or to advise a farmer in the spring as to the crops that will best suit the weather conditions of the succeeding summer and autumn, is at present very problematical. But it is a step towards it that across the Atlantic, and in the Old World to a less degree, some success has been attained in forecasting the weather for more limited periods; whilst the acceptability to the public of this amount of service is shown by the fact that weather reports and prognostics are no longer confined to the *Times*, but are now to be found in most daily newspapers of any pretensions.

In fact the portion of the report just issued that will interest the widest circle of readers is probably that which deals with weather telegraphy, and the details connected with the preparation of the forecasts now become so familiar. Briefly it may be stated that the office receives, when the telegraphic communications are perfect, fifty-three reports every morning, thirteen every afternoon (except on Sundays) and nineteen each evening. The foreign reporting stations are twenty-three in number, and extend along the entire western coast of the Continent and include four stations on the Baltic coast and one in the Mediterranean. At present, forecasts are issued twice a day, at 11 a.m. and 8.30 p.m. The first, which is based on the reports of observations taken at 8 a.m., and arriving between 9 and 10, refers to the probable weather between noon on the day of issue and noon on the day following; this is supplied to the afternoon editions of the newspapers and posted up in several public places in London. The observations on which the 8.30 p.m. forecast is based are taken at 6 p.m. This forecast comes, however, first under the cognizance of the public in the newspapers of the following morning, so that it has the disadvantage of not being read generally until twelve hours after it has been drawn up and fourteen hours after the observations upon which it is based were taken. The Council has had the subject of this delay in the publication of the most widely-read of the two sets of forecasts under its consideration, and has ascertained that for the London morning newspapers and the local issues of those in the more important provincial towns the delivery of the forecast might be made as late as 2 a.m. This would, however, necessitate the organization of a night service, for the cost of which there are no funds available. But it is stated that should the public interest in securing at an earlier hou such information as to probable weather as is conveyed by forecasts become sufficiently developed to induce local authorities of various towns to contribute their quota of the cost of procuring it and to undertake its distribution in their respective neighbourhoods, the Meteorological Office would have no difficulty in supplying it.

In presence of this challenge it will be interesting to observe the value of these forecasts as indicated by the measure of success claimed for them in the Report. Taking the average of the eleven districts into which Great Britain and Ireland are divided the proportion of success attained during the year ending the 31st of March, 1883, is represented as having been equal to 79 per cent., being an improvement of one per cent. as compared with the previous year. This total is divisible into "complete success," 44 per cent., and "partial success," 35 per cent. The greatest amount of "complete success," 50 per cent., was attained in the south of England, the smallest amount, 40 per cent., in the north of Ireland. The proportion of storm warnings sent to the coasts which were justified by subsequent events amounted during the year to 82·5 per cent., showing a slight improvement. It is admitted that the year formed no exception to its predecessors in the fact that more than one serious storm occurred of which no warning was given, but it is believed that such occasional failures are unavoidable. This fact, however, does not detract from the value of service to life and property rendered by so large a proportion of justified warnings out of upwards of five hundred issued during the year. Another valuable service rendered by the Office was the issue of special forecasts gratis during the hay harvest of 1882 to persons selected by the Royal Agricultura!

Society, the Royal Dublin Society and the Highland Society, in different parts of the three Kingdoms, on the condition that the information should be made as widely known as possible, and that a record should be kept of the value of each prediction and sent in weekly. From a tabulation of these reports it appears that "complete success" was attained in respect to 50 per cent. of the forecasts, and "partial success" in 37 per cent. more, whilst the total failures amounted to only 2 per cent. These forecasts were evidently highly appreciated as having an actual money value, and for one district where the hay harvest was late they were prolonged for an extra four weeks at the expense of the recipients. Although the foregoing deals only with a portion of the Report the facts are sufficient to shadow forth the services that meteorological science is capable of rendering to the community in one direction. In another, closely affecting the health of the metropolis, investigations have been continued, as opportunity offered, into the causes and prevalence of London fog. The opportunities, though too frequent to be pleasant, proved hardly sufficient to yield valuable results. But a previous observation as to the abnormal increase of the proportion of carbonic acid gas in the atmosphere has been confirmed, the quantity having risen to 13 parts per 10,000 on one occasion, or more than three times the usual amount.

The last Evening Meeting of the Pharmaceutical Society in the present session will be held on Wednesday next, when a paper on "The Aqueous Extraction of Cinchona Bark," by Professor Redwood, and one on "The Proximate Analysis of the Seeds of Amomum Melegueta," by Dr. Thresh, will be read. The chair will be taken at half-past eight o'clock, but the Curator will be in attendance an hour previously to furnish information respecting recent donations to the Museum that will be exhibited.

* * *

In the House of Lords, on Friday the 21st inst., the Chairman of Committees informed the House that the promoters of the Institute of Chemistry Bill did not intend to proceed further with it. The order of the day for the second reading was therefore read and discharged. It is understood that the promoters hope to attain the incorporation contemplated by the Bill by means of a Royal Charter.

* * *

A correspondent from the south has forwarded to us a warning against an impostor who appears to operate by calling upon a chemist and druggist, and upon the pretence that some person in the neighbourhood has promised to pay for a truss for him, obtaining an estimate of the price of a suitable instrument written upon a bill-head. Armed with this document he canvasses for subscriptions among the benevolent in the locality, and, it is needless to say, when he has exhausted this field betakes himself to another.

* * *

Previous to the election of the present President of the Chemical Society to that office, he had during fourteen years filled the office of one of its Secretaries, and had in many ways shown his interest in the Society. It is now proposed as a mark of recognition of these prolonged services to entertain Dr. and Mrs. Perkin at a dinner at Freemasons' Tavern on the 23rd of April. It is understood that Professor Hofmann has promised to come over specially from Berlin to preside at the dinner.

* *

In giving evidence recently before a parliamentary commission appointed to inquire as to the causes of the commercial crisis under which France is suffering, M. Vée stated that the manufacture of chemicals had remained stationary in that country during a time in which it had increased five-fold in other parts of the world. One of the causes to which he attributed this stagnation was the imperfect education of French workmen, which made it necessary to look abroad for overseers to superintend their operations.

* * *

According to the preliminary statistics accompanying the Medical Register for 1884, the total number of registered medical practitioners in Great Britain and Ireland at the commencement of the year was 24,517 against 23,801 at the beginning of 1883, showing an increase of 716 during the twelve months. The new Dentists' Register contains 5291 names against 5252 in the previous one.

* * *

The last number of the *Moniteur de la Pharmacie* reports the arrest of a woman who was in the habit of obtaining the supply of laudanum for which she craved by presenting at a pharmacy a prescription, concocted by herself, ordering some pills and sixty grams of laudanum. The laudanum she as a rule succeeded in taking away with her, requesting that the pills might be sent to an address, which of course turned out not to be her residence. Seventeen pharmacists appeared to have received a visit from this swindler, who obtained from them jointly about a kilogram of laudanum. Another case reported in the same journal is that of a boy, aged fifteen years, who poisoned himself with prussic acid obtained by means of a prescription fabricated by himself. These cases are worthy the attention of *doctrinaires* who see a solution of the poison question in a provision making the supply dependent upon a medical order.

* * *

At the conclusion of the inquiry at Cheltenham, during which some interest turned upon the dispensing of certain prescriptions ordering oil of savin and liquid extract of ergot (see before, p. 754), the jury returned a verdict that the deceased woman died from blood poisoning, but that although the case was surrounded with very grave suspicion as to the conduct of the medical man who attended her, there was not sufficient evidence to show the cause of the blood poisoning.

* * *

Mr. Saunders, of London, Ontario, states that he has recently had submttted to him for examination two samples of oil of cassia, one of which he found to be adulterated with 50 per cent. of a mixture of castor oil and spirit and the other with about 30 per cent.

* * *

It is announced that the International Health Exhibition will be opened by the President, H. R. H. the Prince of Wales, on Thursday, the 8th of May.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

The fifth meeting of the present session was held in the Society's Rooms, 119A, George Street, Edinburgh, on Wednesday evening, March 19, at half-past eight o'clock.

Mr. John Nesbit, President of the Branch, in the chair.

The minutes of the former meeting were read and confirmed.

The first paper read was on—

TINCTURE OF HYOSCYAMUS.

BY WILLIAM GILMOUR.

The paper is printed on p. 781, and gave rise to the following discussion:—

Mr. Stephenson, in proposing a vote of thanks to the author, said he was particularly pleased to hear that the spectroscope test for this tincture was now discredited, for it was one which pharmacists, as a rule, had not the means of applying. He was not surprised that rectified spirit had failed to give so good a tincture as proof spirit; if the active principle of the leaves existed in the natural juice, then he took it that an aqueous menstruum, containing sufficient alcohol for preservation, would be the most reasonable in the circumstances. These proof spirit tinctures of green leaves were often green when prepared, just as the rectified spirit tinctures, but this colour changed to brown after a short time. He was glad to learn that the biennial leaves were the better. This was corroborative of existing opinion, and it might be recollected that Mr. Donovan had started his investigation in the belief that biennial hyoscyamus was quite inert, but he had not gone far before he found that his opinion was based on experiments with annual leaves, so that when he came to try the biennial he found that they were quite active medicinally.

Dr. Inglis Clark seconded the vote of thanks, and said that the paper was thoroughly practical, and the meeting was greatly indebted to Mr. Gilmour for the interesting manner in which he had communicated his results. Regarding the potency of the annual leaves, he recollected that the late Professor Christison stated in his class lectures, that as grown in some parts of the country they were quite inert, while in others they were potent. He asked if Mr. Gilmour had made any experiments as to the alkaloidal value of the leaves.

Mr. Young remarked that the tincture from the annual leaves was quite different in odour and taste from that prepared from the biennial. Were there any ready means of distinguishing between the annual and biennial leaves?

Mr. Gilmour said that the annual leaves were of a paler colour, and, as Mr. Young had observed, the tincture was different from the other. He had not time to determine the alkaloidal value. The annual undoubtedly contained hyoscyamine, for most of that alkaloid prepared in Germany was obtained from the annual. In referring to some samples which were exhibited, he asked if anyone could explain why the tufted variety of the biennial leaves had now almost disappeared from the market. At the present time most of the biennial variety was received in a chopped condition from the wholesale houses; this was somewhat unsatisfactory, since it favoured adulteration.

Mr. Young stated that the tufted variety used to be more plentiful in Scotland, where it was grown for the market there. This was not the case now, but he would like to see more of the tufted leaves, because there was a feeling of security in using them.

The President moved a vote of thanks to Mr. Gilmour for the specimens which he had presented to the Museum.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The tenth general meeting of the thirty-fifth session was held at the Royal Institution, February 28. Mr. Edward Davies, President, in the chair.

The minutes of the previous meeting were read and confirmed, and the following donations to the Library were announced:—The *Pharmaceutical Journal*, from the Society; The *Canadian Pharmaceutical Journal*, from the Editor; The *Science Monthly*, from the Editor.

The President read a letter, dated February 18, which he had received from Mr. A. H. Mason, resigning his office as Vice-President of the Association, owing to his early departure for Canada.

The President said that the subject of Mr. Mason's letter would be brought before a meeting of the Council, and probably further alluded to at the next ordinary meeting.

Mr. Davies drew attention to a statement in the newspapers in reference to the recent explosion at a London railway station, in which it was stated that an officer had tried to obtain from two chemists lignic acid and not being able to procure the same, he employed a razor to show that dynamite had been used. He (Mr. Davies) said that he was not aware of any such compound as *lignic acid*, nor could he imagine how a razor could give any clue as to nitro-glycerine having been exploded. It was possible that the razor might have been acted upon by nitrous fumes; but he was at a loss to see how this fact could be taken as a satisfactory explanation of the presence of dynamite.

Dr. Symes was then called upon to read a paper entitled "Notes on Pharmaceutical Apparatus." The paper was illustrated by a photograph and drawings.

The paper will be found printed on p. 783.

Mr. Conroy, in proposing a vote of thanks to Dr. Symes, said he had listened to the paper with great interest, and had derived a good many valuable hints from it.

Mr. T. Fell Abraham, in seconding the vote of thanks, thought that no difficulty would be experienced in consequence of the outlet from the steam filtering funnel not being at the bottom, the conductivity of copper being so high.

Mr. A. C. Abraham, in supporting the vote of thanks, remarked that the gauge pipe shown would be of advantage when the observer was opposite to it, as from the sides it was no more distinct. He took exception to the term steam funnel being applied to the one described, which was a hot water or steam *filtering* funnel, and quite different from the apparatus to which the other name was applied, either formerly or recently by himself. The head of the still figured struck him, as it had Mr. Conroy, as being very antiquated, but there might still be something to be said for that design, which was probably in use in Egypt two thousand years ago.

The vote having been put from the chair, was carried unanimously, and Dr. Symes having briefly replied, the meeting terminated.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The annual dinner of the Society was held in the Freemasons' Hall, Surrey Street, on Wednesday evening, March 19, under the Presidency of Mr. J. Preston. A goodly number of the members were present.

Letters of apology were read from Mr. A. H. Allen, F.I.C., F.C.S., Borough Analyst, and Mr. Edward Binks, Lecturer on Botany at the Sheffield Medical School.

After the removal of the cloth, the following toasts were proposed and duly responded to:—"The Queen" and "The Royal Family" were given from the chair.

Mr. J. T. Dobb, in rising to propose "The Success of

the Pharmaceutical Society of Great Britain," said he regretted business was in a very depressed condition, and the outlook for chemists and druggists gloomy. The physician, the surgeon, and the apothecary, the barrister, solicitor, and the clergy, had all to pass an examination to prove their fitness before they were allowed to practise their several professions. When that examination was passed, the law stepped in and protected them from the quack, the charlatan and the pretender or anyone not duly licensed to practise. Is it so with the pharmaceutical chemist and druggist? No! Before they can open shop to dispense, sell or retail drugs, they must, equal with the above-named professions, pass a strict examination in chemistry, botany, materia medica and pharmacy, and prove their qualifications. Are they protected in their vocation after the requirements of the law are fulfilled? No! Grocers, drapers, tinkers and tailors, stores and jacks of all trades in every town and city step into the arena, and sell all the pharmaceutical preparations and drugs, save a few scheduled poisons. Ah! even "poisons," if they have paid the 1½*d.* stamp duty to the Government. Is there a chemist in Sheffield who makes £5 a year out of the A scheduled poisons? Of what use then is the Pharmacy Act? It is no protection to the public and very little benefit to the man who has spent his time and money to qualify himself scientifically to deal competently with the drugs and chemicals required by the public. If the compound preparations of the Pharmacopœia were scheduled, and none but those who had passed through the required examinations should sell retail such articles, then it would be a protection to the public that due care had been taken in the preparation and in the dispensing and vending of these chemicals and drugs, and it would induce well educated youths to enter a business where there would be some prospect of success in life. He ventured to make some remarks of this nature at Chatsworth, at the time the Pharmaceutical Conference visited Sheffield. The *savans* at that meeting turned a deaf ear to such vulgar notions as commerce and how a chemist was to earn a living; nothing but science and education could be taken up by the Society. The question had developed into one of intensity since that day, and had become an important factor in considering the position of the trade. He was pleased to find that Professor Attfield, by two recent speeches, now published, appeared to have grasped the subject. He trusted his views would be laid hold of by the Executive of the Pharmaceutical Society, and that the result would be continued success and prosperity to that body, and that all the branches of the profession would participate.

Mr. W. Ward, in responding on behalf of the Pharmaceutical Society, said he presumed he had again been singled out on account of his occupying the post of Local Secretary. On the present occasion he most heartily acquiesced—the proposer of the toast having referred to the Society in more gratifying terms than he had sometimes listened to at their annual gatherings. It had been his lot on more than one occasion, in replying to the toast, to defend the action of the Council from attacks which had been made, often based upon ignorance, as he had been able to show. Still there was a good deal of complaining that the Society had failed in giving that attention to some of the grievances which undoubtedly existed in their midst. Mr. Dobb had referred to the want of better protection of the trade and the apathy of the Council. He could not but join issue with him. Undoubtedly one of the primary objects aimed at in the Act of Incorporation was not only the advancement of pharmacy, the promotion of a sound system of education, and the safety of the public, but "the protection of those who carry on the business of a chemist and druggist." He should be delighted to see the Council displaying more energy in this direction, The recent poisoning case by infants' mixture in their town was one amongst some of the evils that existed, and which, he considered, should be dealt with by the Council. He thought the Act was sufficiently clear to gain a verdict, and, if not, it would be but another proof of the great importance of stopping the wholesale vending of poisonous preparations by unregistered men. After referring to the action of the Council with respect to the Amended Pharmacy Bill and urging the members to aid the Benevolent Fund, he begged to thank them for the way in which they had drunk to the Pharmaceutical Society.

Mr. Furness, in proposing "The Trade Association," said the Chemists and Druggists' Trade Association had been in existence ten or twelve years. It was established (not to be antagonistic—but as an aid—to the Pharmaceutical Society) more especially in accomplishing work which that Council were either unable or unwilling to perform. It had justified its existence by the good useful work it had done under considerable difficulties, and, of which, he should leave Mr. Jervis to give an account when responding to the toast. His position as a member of the Executive of the Trade Association made him better able to deal with the matter. However, he might say there was still plenty of work to be done, and suggested the Association might, with advantage, direct its attention to the recent case of poisoning by infants' mixture in the town, where the drug had been supplied by a grocer and proved to contain opium. He had reason to believe that infringements of this character were as numerous as they were dangerous to the public, and damaging to chemists and druggists. It was unsatisfactory to learn from the last Annual Report, that the Association was limited in its usefulness by want of funds. It was doing good work and was worthy of more support than it received. That this should be the case was another proof of the gross apathy existing among their fraternity, seeing that only about 4000 out of 13,000 entitled to join availed themselves of its advantages. This was about the same proportion that joined the Pharmaceutical Society's ranks, and he believed that substantially they were the same members, that was to say, there were not 4000 members of this Association, and another 4000 members of the Pharmaceutical Society, showing 8000 as taking an interest in their self-improvement and self-defence, but only about 4000 or one third of the whole body, who would voluntarily take any steps to avail themselves of representation and protection unless when individually assailed, and these outsiders were the biggest grumblers. It was a deplorable state of things, and admitted of no excuse, because whoever did not approve of the Pharmaceutical Society's work might fairly join the Chemists and Druggists' Trade Association of Great Britain, which toast he had the pleasure of proposing.

Mr. Jervis, in responding, said that the Association did its utmost in defending the interests of the chemist or druggist. As a member of the Executive and of the Law Committee, he could state that the Association which he had the honour to represent had nobly done its duty, and he would specially mention the Shepperley case—a case of itself, he maintained—had been of incalculable benefit to every chemist and druggist in the land, and if they had not been enabled to take that case into court and carry it through till victory crowned their efforts, not a chemist or druggist dare ever have prescribed or recommended the most simple remedies for the cure of a disease, no matter how simple, and, in fact, he would have been debarred from exercising a right which any old woman not having the title of a chemist could claim. He could safely say that if any clear case of infringement of the Pharmacy Act, if represented to them, would receive earnest attention and consideration; in fact they wanted work, and if the great body of the chemists would only rally round them he was sure they could be of immense benefit to them. He held that they could do a work which the Pharmaceutical Society could not undertake. He thanked them for the confidence reposed in the Association.

Mr. Jacques proposed the Sheffield Pharmaceutical and

Chemical Society, which was appropriately responded to by Mr. Cubley.

In proposing the Local Educational Institutions, Mr. Ellinor said he hoped the time would soon come when Sheffield would be one of the best instead of being at the bottom of the list; that the enlargement of Firth College and its extension would be the means of combining the education of medical, dental and pharmaceutical students, and that a full curriculum might be provided, in the which a medical, dental and pharmaceutical practitioner would be responsible for the attendance and signing up of each of their respective students. Coupled with this toast, Mr. Ellinor named the other educational institutions and the Central Higher (Board) Schools.

Mr. Garnet responded.

Mr: Ward proposed the President, which was suitably acknowledged by Mr. Preston.

Mr. J. Marshall had the pleasure of proposing the toast of the Vice-Presidents and Council of the Sheffield Pharmaceutical and Chemical Society. He said all would heartily join in drinking their health, because it was well known how careful they were to take up any matter which might deserve their attention, and the energy they displayed in carrying out any worthy object. He regretted that the Council did not meet with the support which they might reasonably expect. In looking at the small annual subscription (5*s.*), he said there could be no excuse for non-membership. He considered that the chemists and druggists stood very much in their own way; they wished for protection in their calling, and when this was necessary, who were more ready to call out than those who held aloof? There was no doubt about the Society doing good. The Council were now carefully watching the much to be regretted state of affairs (the many poisoning cases), and would no doubt do what all wish to be done when the right time is at hand. He remarked how necessary it was for all to be united at a critical time like this. He had noticed how the Council had frequently taken up matters which concerned all chemists aud druggists, and had often sent up resolutions and suggestions to the Pharmaceutical Society which had been respected, and would still be more so if all were to attend the meetings and use the power which they possessed. The junior members had great reason to be thankful to the Council for their help in connection with their studies, especially for the free use of the Society's rooms and library, and in the many ways in which they had shown their interest in the welfare of the younger ones, and he had no doubt but that they (the juniors) would still have their influence (both collectively and individually), and help to obtain admission to the Local Botanical Gardens. He had great pleasure in coupling with the toast the names of Mr. Watts and Mr. Furness.

Mr. Furness responded.

Mr. Dobb proposed the toast of the "Treasurer and Secretary," which was replied to by Messrs. Jervis and Newsholme.

Mr. Fox proposed the "Assistants' Association," to which Mr. Smith responded as follows:—The introduction of this toast is an honour the Junior Association has reason to be proud of, and I respond to it with much gratification and pleasure. Being so recently inaugurated we have no extensive history to review, but looking forward there are signs of an increasingly useful and successful career for this Association. The classes are well attended and most satisfactorily conducted, and, when we consider the number of students, and the distance many have to come who attend, together with the fact that the only attraction is that of an intellectual nature, I think we have a proof that good and real work is being done. The Association has increased the number of members in your Society, and I would suggest in return that some of the papers read at the monthly meetings be specially addressed to the students, papers tending to produce a familiarity with the ways of Bloomsbury Square,—the very name of Bloomsbury Square being a terror to many provincial students—a familiarity being productive of confidence, which is half the battle. The obtaining of permission to use the Botanical Gardens, I think we may well leave to the Council. Such permission is most desirable and needful. To the Council also we would tender our warmest thanks for the great help they have given us and for the lively interest they take in our proceedings.

After the complimentary toast of the "Visitors" had been proposed and responded to, the meeting, which was continued to an early hour in the morning, separated.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, March 20. Dr. W. H. Perkin, President, in the chair.

The following certificates were read for the first time:—Messrs. W. D. Borland, A. F. Dimmock, J. Gaskell, W. H. Perkin, jun., A. G. Perkin, and J. W. Pratt.

During the evening a ballot was held and the following gentlemen were declared by the Scrutators, Drs. P. Frankland and Morley, duly elected Fellows:—Messrs. F. W. Brown, H. Cave, F. W. Fleming, E. E. Graves, A. E. Lewis, J. E. London, G. A. Parkinson, S. Smith, G. Tunbridge, and T. U. Walton.

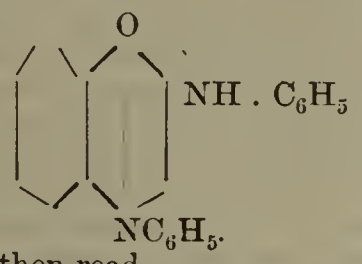
Mr. Tribe then read a note—

On the Preparation of Marsh Gas. By J. H. Gladstone and A. Tribe.—In 1873 (*Chem. Soc. Journ.*, xi., 682) the authors described two reactions, in which marsh gas was produced free from other hydrocarbons by the action of the copper-zinc couple on methyl iodide in the presence of water or alcohol. The loss of methyl iodide was, however, considerable, varying from 23 per cent. to over 50 per cent. In the present note the authors describe a slight modification of the apparatus, by means of which this loss can be prevented. About 600 grams of thinly granulated zinc are immersed in a 2 per cent. solution of copper sulphate until the latter is decolorized. The copper-zinc couple is washed with water and finally with alcohol; it is introduced into a flask, the mouth of which is closed by a doubly perforated cork. Through the cork pass the end of a stoppered funnel containing the methyl iodide, and the end of an upright wide glass tube, 12″ long and 1″ in internal diameter, filled with copper-zinc couple. The upper end of this tube is also closed by a doubly perforated cork, into which fit a delivery tube and the end of a stoppered funnel containing alcohol. This upright tube serves the double purpose of a copper-zinc scrubber and an inverted condenser. A mixture of 20 c.c. of alcohol and 20 c.c. of methyl iodide being allowed to run into the flask, a steady evolution of marsh gas proceeds; the first litre was evolved in eight minutes, 7053 c.c. were obtained, the theoretical yield being 7100 c.c. The reaction can be much expedited by gently heating the flask.

The Secretary then read a paper—

On the Action of Dibrom-α-Naphthol upon Amines. By R. Meldola.—In a preliminary note (*Chem. News*, Jan. 19, 1883) the author called attention to the remarkable facility with which dibrom-α-naphthol entered into reaction with certain amines, forming, in the case of anilin, paratoluidin, and β-naphthylamin, well characterized crystalline bases. The action of this dibromnaphthol upon diamines has been made the subject of a patent by L. Casella and Co. (*Germ. Pat.*, No. 20,850), and the reaction has been investigated by R. Möhlau (*Ber.*, 1883, 2853). The author, therefore, confines himself to a description of some results of the action of dibrom-α-naphthol upon monamines. On mixing dibrom-α-naphthol with about three times its weight of aniline, a white crystalline mass of aniline dibromnaphtholate is formed. On heating

to nearly the boiling point of aniline, the contents of the flask acquire a deep reddish brown colour; the reaction is complete in about ten minutes; when cool the mass forms a solid cake of crystals. The substance was purified by washing and recrystallization from boiling alcohol and formed orange red needles melting at 179°, it possessed basic properties and agreed with the diphenyldiamidonaphthol of Goes and of Tincke. The zinc and platinum salts were prepared and analysed and the identity of the substance with β-naphthoquinonedianilide conclusively established. With orthotoluidin a similar reaction took place, but nothing separated out on diluting the contents of the flask with alcohol. With paratoluidin similar results were obtained and the product crystallized out in silky orange needles melting about 175°. A crystalline body was also formed when α-naphthylamine was used. The action of dibrom-α-naphthol upon amines, therefore, furnishes a most simple method of obtaining these quinone-imide derivatives in large quantities. The author then discusses the significance of this production, as affording an insight into their constitution and considers that the constitution of β-naphthoquinonedianilide must be—



The Secretary then read—

A Note on the Existence of Salicylic Acid in the Cultivated Varieties of Pansy and in the Violaceæ generally. By A. B. Griffiths and E. C. Conrad.—The authors have extracted colourless acicular crystals from pansy leaves, etc., soluble in ether, alcohol and boiling water, which gave with ferric chloride a violet colour. A combustion gave numbers agreeing with the formula of salicylic acid. The leaves yielded 0·13 per cent., the stems, 0·08 per cent., the roots 0·05 per cent., whilst the flowers contained only a trace. The authors cut sections of the leaves, etc., but failed to discover any crystals of salicylic acid in the cells.

The Society then adjourned to April 3.

The Anniversary Meeting will be held on Monday, March 31.

SOCIETY OF ARTS.

Alloys used for Coinage.

At the commencement of the second lecture of the Cantor series upon "The Alloys used for Coinage," Professor W. C. Roberts explained the use of several terms not always clearly understood. The terms alloy, allay or lay, are generally applied to characterize the base metal used in the mixture, and not, as correctly they should be, to the mass itself, the term was most probably derived from the Latin *adligo*—to bind to, or a Teutonic word meaning to lessen. Though the terms sterling and standard are now almost synonymous, yet formerly the term sterling was used to distinguish a special alloy of silver and copper of a higher degree of purity than the standard. The standard of fineness is a term employed to designate the amount of pure metal in an alloy, and is now almost universally calculated to the decimal method; nations now maintain a nearly equal "standard of fineness" in order to avoid loss and facilitate commerce. For the purpose of melting the metals and mixing the alloys, crucibles composed of graphite and fire clay are employed; the crucibles used for melting gold hold about 1200 ounces and those for melting silver about 4000 ounces. Coke is generally used as the heating material, although in Berlin, the crucibles are heated by means of gas generated in a retort in direct communication with the furnace. Reverberatory furnaces are only used in the melting of bronze, as the loss of the rarer metals owing to leaky hearths would be too large to allow their use. It is necessary that alloys should be so prepared as to ensure rigidity, durability and uniformity of composition; it is further imperative that the alloy shall be able to *flow* easily into the finest lines of the engraved die when struck. The "fineness" of the alloys can be tested by means of an electric current, on which test the lecturer expressed his intention of speaking more fully; it is also noticeable that both the ring is clearer and the rigidity greater in the case of the standard alloy than in that of the pure metal. Copper is found most convenient to alloy with gold, as the colour is rather heightened than lessened by the admixture; the reverse is the case when silver is used, for if the alloy contain more than one-third of silver the colour of the gold is completely lost. The use of triple alloys has been suggested, but this would only lead to more intricate details. Professor Roberts then entered into an explanation of the differences of the troy, carat and decimal systems. The carat system was either derived from the Arabs or from the Roman mint; the decimal system, first employed on the Continent in 1794, was not introduced into England till 1882. The lecturer then gave a number of tables showing the changes in the composition of alloys from the most ancient times. A Greek coin of about 359 B.C. was found to contain 99·7 per cent. of pure gold, this being the greatest purity obtainable by the method then in vogue; the early British coins (B.C. 50) contained only 40·5 per cent. of pure metal, whilst the Anglo Saxon alloys differed greatly in their "standard of fineness." Since the Norman conquest, however, gold coins have contained nearly the same percentage of pure metal, excepting in the latter part of Henry VIII.'s reign, when it fell as low as 83·3 per cent. The present standard of 91·66 per cent. is also that of British India, Russia, Portugal, etc., whilst that of France and the remainder of the Latin Union is about 90 per cent. In regard to silver coins, they also sustained only one very marked deterioration of standard, falling in the sixteenth century to 25 per cent. of pure metal. The English standard is at present 92·5 per cent., whilst France has two, one of 90 per cent. and the other of 83·5 per cent. Professor Roberts then gave the composition of a number of alloys which had been introduced. That of Peligot consists of 58·1 per cent. of gold, 36·1 per cent. of copper and 5·8 per cent. of zinc; the modern nickel alloy consists of 75 per cent. of copper and the remainder of nickel, whilst the older alloy consisted of 77·6 per cent. of copper and 20 per cent. of nickel, the remainder being made up by small quantities of cobalt and iron. The advantage of these nickel alloys consists in the value of their magnetic properties for testing. Alloys of aluminum have also been suggested owing to their light weight.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association, held March 19, Mr. H. M. Hadfield in the chair, a paper on "Essential Oils: their Derivatives and some of their Uses," by Mr. W. A. Wrenn, was read by Mr. H. Cracknell (Hon. Sec.).

The author first mentioned oleum amygdalæ essentiale, giving an account of the collection of the almonds, their habitat, and the amount per cent. of essential oils yielded both by the almonds themselves and also the cake, being ·4 per cent. to ·95 per cent., and ·75 per cent. to 1·6 per cent. respectively, the crude oil having a specific gravity varying from 1·056 to 1·070. The percentage of hydrocyanic acid was stated to vary between 8 per cent. and 12 per cent., the processes for freeing the oil from this acid were mentioned, distillation with red oxide of mercury being given as the most convenient for small quantities. Tests were also given for the impurities in the oil; the pure oil should have a specific gravity of 1·049 to 1·051. Oleum cajuputi was next mentioned. Four samples of this oil having been examined all gave

evidence of traces of copper. The author had submitted four samples to redistillation, and in all cases obtained a colourless product, having a specific gravity of ·916 to ·918. Oleum caryophylli next received attention, the various sources of the oil being alluded to, and the product stated to be from 12 per cent. to 22 per cent.; the distinctive characters of the oils distilled from the flower buds and the stems of the plants were enumerated. A short account of oleum copaibæ essent. was then given, the quantity yielded from the balsam varying from 36 per cent. to 60 per cent.; the Para balsam yields by far the largest amount of oil, and the oil thus obtained has the best aroma. The specific gravity varies from ·878 to ·900. Oil of turpentine is the chief adulterant of this oil, and may readily be detected by its relative solubility in alcohol. The boiling point of oleum copaibæ is very high, being about 500° F. Oleum cubebæ was then alluded to. The drug is now causing a little sensation in the market on account of the very high price which is obtained for it. This is supposed to be due to the great demands from America, where it is now largely used in catarrhal affections of the air-passages. The product of oil from the fruit is about 7 per cent. to 12 per cent. The specific gravity is from ·924 to ·929. Oleum juniperi, oleum santal. flav., and oleum sassafras were all briefly mentioned, and the paper was brought to a conclusion with a few remarks on the two varieties of wintergreen oil, viz., that obtained from *Gaultheria procumbens*, the American source, and that obtained in East India from *Gaultheria punctata*.

Parliamentary and Law Proceedings.

House of Commons.

Patent Medicines Bill.

In the House of Commons on Wednesday, Mr. Warton in moving the second reading of this Bill, remarked that in bringing the subject of patent medicines before the House he had two objects in view. In the first place he wished to point out that the Government stamp gave undue prominence to patent medicines and induced people to take that which was injurious to them. Many people who read patent medicine advertisements believed that both Houses of Parliament had in some way sanctioned and almost sanctified those medicines. He submitted that it was very wrong for the Government to derive any revenue from such an unworthy source. When this question was last before the House the Under-Secretary for the Home Department said he could not make any promise as to what the Government would do in the matter, but he hoped that some better system than that now in force would be adopted. The Government, however, had done nothing at all, and it appeared to him that whatever course they adopted they were in favour of spreading disease. In his opinion it was the duty of the Government to bring this subject forward because they alone could deal with the fiscal part of the question. The second object he had in view was to show that patent medicines contained poison. Many persons had died through taking those medicines. The man who recklessly sold them was little better than a murderer, and the Government who failed to take measures to alter such a state of things connived at murder. What was the use of analysing those medicines when a poor child—for children were generally the victims—or a poor woman was dead? What he wished was that some feeling should be shown for these poor women and children so as not to have them poisoned by quacks. By the Pharmacy Act of 1868, the Pharmaceutical Society had the power of declaring what were poisons, and, when any new drug with poisonous properties was brought to light, of including it in the list. The Society was to pass a resolution to the effect that a certain drug was a poison, that resolution was to be submitted to the Privy Council, and if the Privy Council approved it was to be published in the *London Gazette*, and thenceforth the article so named became a poison under the Act of 1868. The effect of that was that any person going to a chemist's shop and asking for arsenic or any other drug in the list of poisons had to give his or her name and address and answer a variety of questions. But one might buy patent medicines in bottles 18 inches high and 12 inches wide containing an immense amount of poison, and the curious part of the Pharmacy Act was that the rights of the proprietors of patent medicines were carefully preserved. Now, he was for preserving vested interests, but there was one vested interest he would not preserve and that was the vested interest in poisoning people. At present one might buy these poisonous medicines by wholesale, not only in the shops of chemists, where there were generally gentlemen of education and responsibility, but in grocers' and petty village shops. His Bill provided that any person who was the owner or proprietor of a patent medicine might have his medicine analysed by the Pharmaceutical Society, and so in like manner any respectable chemist who sold patent medicines, or persons who bought them might have them analysed by the Pharmaceutical Society. If it was found that the medicine contained poison let the Pharmaceutical Society pass a resolution similar to that provided by the second section of the Act of 1868, and let them state that "this elixir"—for that was the favourite word—contained poison, and the resolution having been approved by the Privy Council, let it be published in the *London Gazette*, and after that the medicine became a poison subject to the restrictions of the Act. He thought that the Government might put aside their political nostrum of the Reform Bill for a time and attend to the lives and health of the people.

Dr. Farquharson considered that there was little need for saying much to urge upon the House the necessity for legislation of this kind, as the Government themselves had shown their appreciation of the importance of the subject. It was an absurdity to fence round the sale of poisons, when any one could, by putting a Government stamp on the bottle, sell any farrago of poisonous stuff. Great loss of life and health was caused by the sale of these patent medicines, as was shown by the Registrar-General's report. In 1881 there had been twenty deaths from the use of chloral hydrate, two from Godfrey's cordial, one from anodyne cordial, eight from chlorodyne, one from aniseed, one from Stather's soothing syrup, and fifty-one from patent medicines the names of which were not stated. It was certain, moreover, that these deaths could not possibly indicate the amount of loss of life caused by these deleterious substances. There had been a great increase in the consumption of patent medicines since teetotalism had become fashionable. There was a great demand for pick-me-ups and cordials, and there was no doubt that an enormous quantity of chloral was consumed by ladies. It was impossible altogether to check the sale of these patent medicines, although he himself would like to see a sweeping Bill on the subject. All medical men detested secret remedies, but of course it was impracticable to suggest any sweeping measure. There were great vested interests in the way, and the British public was fond of domestic medication, and even of a little quackery. What they had to do, then, was to regulate the sale of these medicines as best they could. This Bill was founded on French lines. In that country a medicine could not be stamped until it had been officially analysed, but the regulation was frequently evaded, in fact, unless the analysis were repeated every week or so, it would be of little use. He would suggest one or two alterations in this Bill. The word "proprietary" should follow "patent," so as to include unstamped mixtures, frequently containing deleterious ingredients, which were sold to a large

extent in villages where there were no druggists' shops. Then there was a difficulty as to the analysis of the Pharmaceutical Society that it would only refer to statutory poisons, without including preparations which, without being absolutely poisonous, were on the borderland. Another objection was that the sanction thus given by the Pharmaceutical Society would largely increase the use of these patent medicines. He would recommend that the Government should harden their hearts and give up the patent medicine stamp, which brought in £154,000. This might, in his opinion, be made up by an increased charge on the licences for the sale of these drugs. Under the present system the Government stamp implied to many ignorant persons a direct sanction and a patent which did not exist. The stamp might be used for any preparation composed of more than one ingredient and recommended for some specific purpose which was only liable under the excise laws. A second recommendation which he would make would be that every proprietor of a patent medicine containing poison should be obliged to put a label with the word "poison" on the bottle and wrapper, with a direction that such medicine must be prescribed with caution. This caution might be extended to substances of injurious, if not directly poisonous, nature, such as teething powders, which contained mercury and opium. Then, again, the innocent seller should have a remedy against the proprietor and manufacturer. If the proprietor failed to put the word "poison" on the bottle, the Pharmaceutical Society might be called on to analyse the medicine, the cost to be paid by the proprietor in the event of its being found to contain poison, with penalties recoverable under the Pharmacy Act. The most important part of the Bill was the 5th section. It was absurd that when such precautions were taken under the Pharmacy Act anything might be sold when labelled as a patent medicine at any grocer's or at any stores. He thought it was anomalous that the druggists should be hampered by restrictions which were not imposed on stores. He further submitted that powers should be vested in the local authorities to enable them to undertake prosecutions under the Pharmacy Act as under the Adulteration of Food Acts. Those prosecutions at present were undertaken by the Pharmaceutical Society, thereby bringing upon it, on occasions, unmerited obloquy. In conclusion, although he could not agree to all its provisions, he thought the House owed a debt of gratitude to the hon. member for Bridport for bringing in the Bill.

Mr. W. JAMES asserted that the preamble of the Bill, reciting that many deaths had occurred from the use of patent medicines, had not been made out. During the last two years not more than seven deaths had arisen from the use of these patent and proprietary medicines, against one hundred and fifty-two deaths caused by drugs sold by chemists, the use of which resulted in death by suicide, misadventure, and other causes. A boy died last year who had been taking Holt's whooping-cough specific, but the medical man admitted that he merely guessed that death was due to the effects of antimony contained in it, and it was almost impossible to say whether death was caused by the antimony or by natural causes. The matter was too serious and far-reaching to be treated in a private Bill; if it was taken up at all, the Government should deal with it. The present Bill was utterly unworkable, and would inflict great hardship on an immense number of persons. There were no less than from eight hundred to one thousand owners of these proprietary medicines, nineteen thousand people were employed in their manufacture or sale [Mr. Warton: So much the worse], they brought in £150,000, and thirty million packets were sold in the course of a year. Under these circumstances he did not think the Bill ought to be supported by the House, and he therefore moved that it be read that day six months.

Mr. HOPWOOD, in supporting the motion, doubted whether any legislation of this character had been productive of any real benefit to the community. He believed the Sale of Poisons Act had done no good, its effect being only to delude the public and to vex a number of honest men in their employment. Such legislation further tended to create a medical monopoly, and something of the feeling of trades unionism might be detected in the hostility shown by coroners and medical gentlemen towards patent medicines when the deceased had been shown to have lately used them. If these medicines were deleterious, the producers of them ought to be answerable to the common law.

The ATTORNEY-GENERAL said the Government could not assent to the second reading of the Bill, although it was introduced with objects with which any one might sympathize; but it was necessary to look to the means proposed for the attainment of those objects, and, doing this, the Government could not accept the provisions of this Bill, which would treat as a poison any medicine containing any poison, however innocuous the quantity might be in the preparation of which it formed part. The Government had the matter in hand, and was prepared to treat it in a much broader sense in a Bill which would be introduced into the other House, and when it reached this House he hoped the desire of the hon. member for Bridport for legislation on the subject would induce him to stay his obstructive hand, and that his own introduction of a Bill would constitute a sort of implied contract with him for the adoption by him on this subject of a course, the novelty of which would be fully appreciated by the House. But the Bill of the hon. member could do no good and must do evil by harassing people unnecessarily; for, in this respect, it would constitute one of the most flagrant specimens of the kind of legislation against which the hon. member frequently protested.

Mr. A. O'CONNOR said if he approached the consideration of the subject without bias he should be inclined to support the Bill, for he had not been convinced by the arguments used against it, and it was admitted that illness and death were caused by patent medicines. He failed to see that the subject required such large treatment that only the Government could deal with it. If the Bill would be beneficial in its operation, he could not understand why Ireland was to be excluded therefrom.

Mr. WARTON said that the reason why he had excluded Ireland was that he did not know what body in that country would take the place of the Pharmaceutical Society in Great Britain; and he had but followed the wording of the Pharmacy Act. The case of the widows and orphans who were interested in the sale of patent medicines could scarcely be put forward seriously against the safety of the public. The hon. member for Stockport's objections applied not so much to the Bill as to the doctors, whose alleged monopoly, especially as regarded vaccination, he was always opposing; but, as even medical coroners occupied an independent position, the suggestion that they conducted their inquiries with a bias against patent medicines, was an unworthy imputation. With regard to the argument put forward by the Attorney-General, he thought they might trust the Pharmaceutical Society not to brand a medicine as a poison unless it was really poisonous. Unless the quantity of the deleterious ingredient which it contained rendered the medicine poisonous, he did not want it to be branded as a poison. He was glad that the result of the motion which he brought forward on that subject two years ago had been so far beneficent that the Government were now pledged to introduce into the other House a bill relating to it; and he hoped that the Chancellor of the Exchequer would consent to abandon as a source of revenue the stamp duty now payable on medicines of that sort, which was supposed to give them the sanction of the State. Unless the Government gave him a positive pledge that they would deal with the fiscal question as well as with the other part of the subject, he should

feel compelled to take the sense of the House on that measure, in order to show that that was a question of great importance which had been too long shelved and neglected.

The House was cleared for a division, but ultimately the second reading of the Bill was negatived without one being taken.

Supposed Death from taking Chlorodyne.

On Monday, the 17th inst., Mr. T. C. Brian, the Plymouth Coroner, held an inquest relative to the death of Christopher Snell.

The wife of the deceased said that her husband was 64 years of age. For a year or so his health had not been very good, although, on the other hand, he had not been so unwell as to require medical aid. For about five years he had suffered from a cough. Witness had given the deceased chlorodyne since the previous Tuesday. She usually administered ten or twelve drops in the evening, but she discontinued it on Friday because she thought the cough was better. Witness was certain that he had not taken any chlorodyne without her knowledge. Her reason for discontinuing the chlorodyne, was because he seemed stupid. Now that her attention had been called to it she fancied that the deceased had seemed drowsy after every dose. She had bought this medicine at Messrs. Wills, Son and Box, in George Street. Deceased died in a stupor, but complained of a pain in his side.

William Henry Andrews said that the deceased had often spoken of his cough. On Tuesday evening witness was at the house, and the bottle of chlorodyne was produced, when the deceased requested him to read the directions. He did so, and poured out ten drops, and having put them into half a glass of water gave them to the deceased. On Wednesday he had two similar doses. The directions stated that the dose must be given when the cough was troublesome.

Mrs. Snell, recalled, stated that it was a fact that the deceased took the dose twice in one day ; it was given him by her son.

The inquiry was adjourned until Wednesday in order that a *post-mortem* examination might be made.

At the adjourned inquest, the widow, recalled, said the bottle of chlorodyne used by the deceased was not kept in the room occupied by the deceased. As far as she knew the medicine had not been touched since she placed it in the kitchen on Friday. When he awoke on the Monday morning deceased was not drowsy. She first saw a great change in him about half-past ten in the morning, and from then to his death she did not leave him.

Mr. E. H. Edlin, surgeon, stated that he had made a *post-mortem* examination. The brain was slightly congested and in a state indicative of disease. The heart was flabby, there being fatty degeneration. The right lung was also in a congested state, indicating chronic pleurisy. There was, however, nothing to account for death under the circumstances described. According to the evidence the deceased did not take a dose of chlorodyne after Friday, but if it had transpired that he had had one on the Friday morning, witness would have considered that with the disease it had accelerated death. Chlorodyne was very poisonous, and contained three distinct poisons, for any one of which, bought separately, the purchaser would have to sign a book at the chemist's shop. He considered it a very unsafe thing.

After a brief deliberation the Jury returned a verdict of "Death from natural causes," adding a rider to the effect that "The Jury consider it is a matter of regret that chlorodyne can be freely purchased by the public, without any kind of restriction."—*Western Morning News.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Position of Pharmacy.

Sir,—"A man of straw," it appears, may sometimes be of very great service; in fact, we are told that even a single straw may play a very important part on the stage of life. My "straw man," in falling, has evidently had an effect upon Mr. Wilkinson, and has restored his equilibrium. A correspondent writes me—"Mr. Wilkinson must either have forgotten what he wrote first or else he does not know the English language." Another says, "Mr. Wilkinson's second letter is strangely at variance with his first."

Now I do not suppose that either of these gentlemen have hit the mark. Mr. Wilkinson's first letter was the outward and visible sign of an inward organic disturbance, that has now passed away (hastened in its departure possibly by the shock occasioned by the fall of "a man of straw"); his second letter is the result of a fast returning convalescence, so that we may now, I think, safely leave him, assured of the fact that instead of a vigorous opponent the Council has, as hitherto, a loyal and intelligent supporter, and what you, sir, and most of us thought was a weakness "in the chain" has turned out to be only a little rust which has been rubbed almost entirely off by a "bit of straw."

Before bidding Mr. Wilkinson adieu, kindly allow me to say that if he does not really "know of any to whom my remarks apply," he is the only chemist for miles round who does not; and lastly, to quote his own words, as all the members of the Council are chosen by members of the Society, and as year after year the *personnel* of the Council remains almost identically the same, we must suppose that the electors have "chosen those whom they consider the most suitable," and are, on the whole, perfectly satisfied with them. Your Stockport correspondent I would advise to apply the advice of Jupiter to the gentleman who prayed him to assist him out of his difficulty, and I would say to him, *Qui s'excuse, s'accuse.*

131, *Embden Street, Manchester.* J. Hart.

Messrs. Bourne, Johnson and Latimer.—The information has been already published that the Inland Revenue authorities have decided that if the preparation consists entirely of pure menthol it will be exempt from stamp duty.

F. R. M.—We do not think any further steps were taken.

J. Thompson.—You will see that the Bill, which did not have the sanction of the Government, has been rejected.

"*Broad.*"—Professor Graham's Lectures on the Chemistry of Breadmaking will be found in vol. x. of the present series, pp. 804, 883, 923, 1028 and 1049.

G. Gordon.—Lathræa squamaria. Please attend in future to the instructions on another page as to addressing communications intended for the Editor, and make sure that the stamps affixed are sufficient.

J. Epps.—Lathræa squamaria.—It is rather local than rare.

Apprentice.—The solubility cannot be increased to any important extent without additions that alter the character of the compound. See a paper in vol. vii., p. 490.

Errata.—On p. 773, col. i., line 3 from bottom, for "minutes" *read* "seconds." On p. 775, col. ii., line 38 from top, the word quoted from Watts's 'Chemistry' should be "octohedrons," instead of "octahedrons,"

W. Mackereth.—Your letter has been handed to the Secretary, to whom all communications concerning the non-delivery of Journals should be sent.

Communications, Letters, etc., have been received from Messrs. Ball, Bell, Smith, Dott, Williams, Rook, Wyley and Co., Hearder, Sedford, Vulcan.

SPECIAL NOTICE TO THE TRADE.

We have just received the following:

Inland Revenue, Somerset House,
London, W.C., 25th March, 1884.

GENTLEMEN,—With reference to your letter of the 12th inst., respecting the liability of **"MENTHOLEUM"** to Stamp Duty, I am to state that as the preparation consists of Pure Menthol it would be within the exemption in favour of a pure drug.

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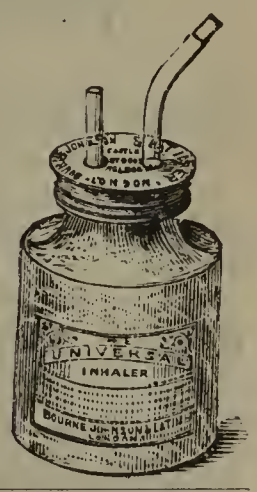

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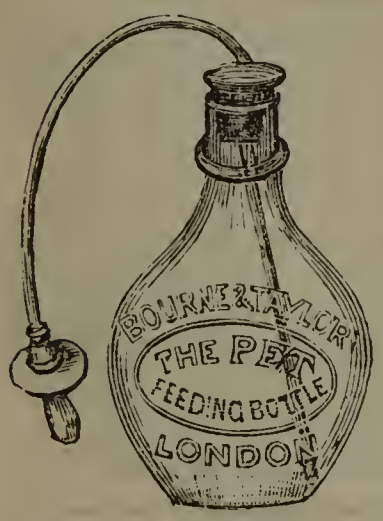

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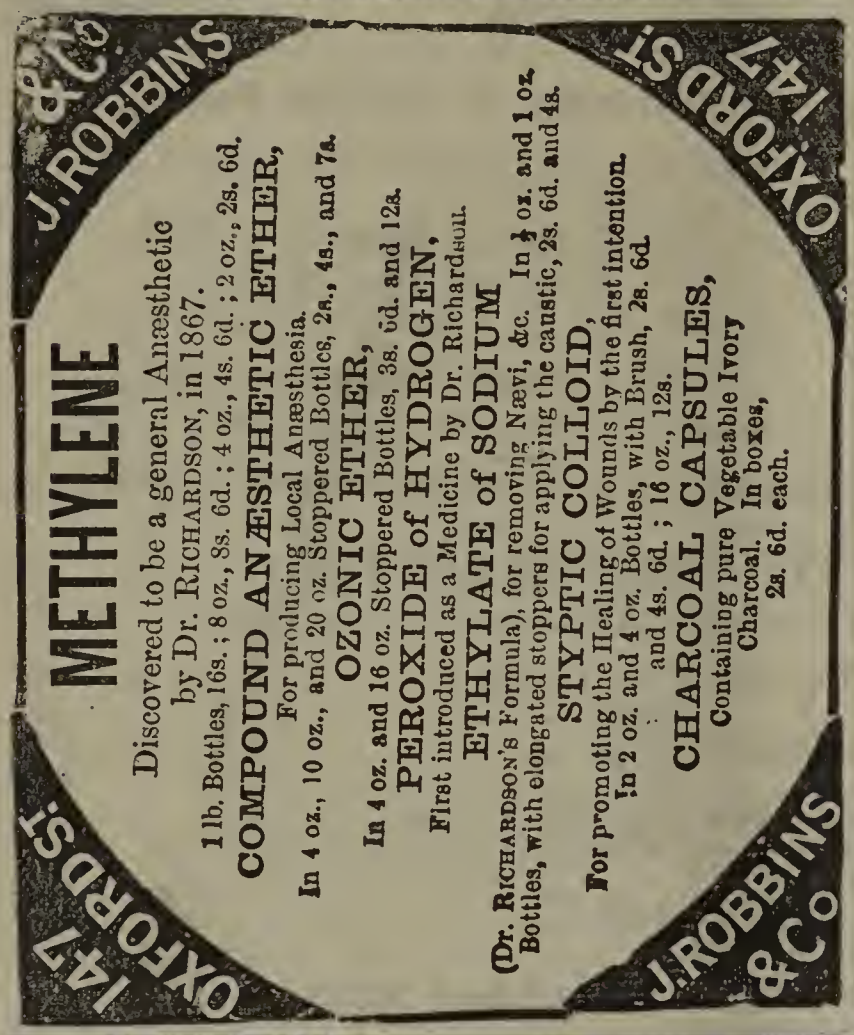

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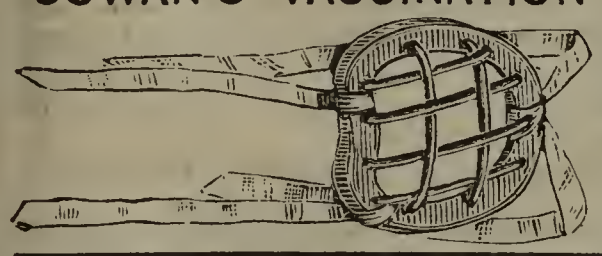

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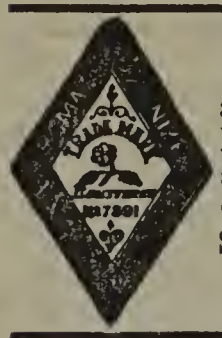

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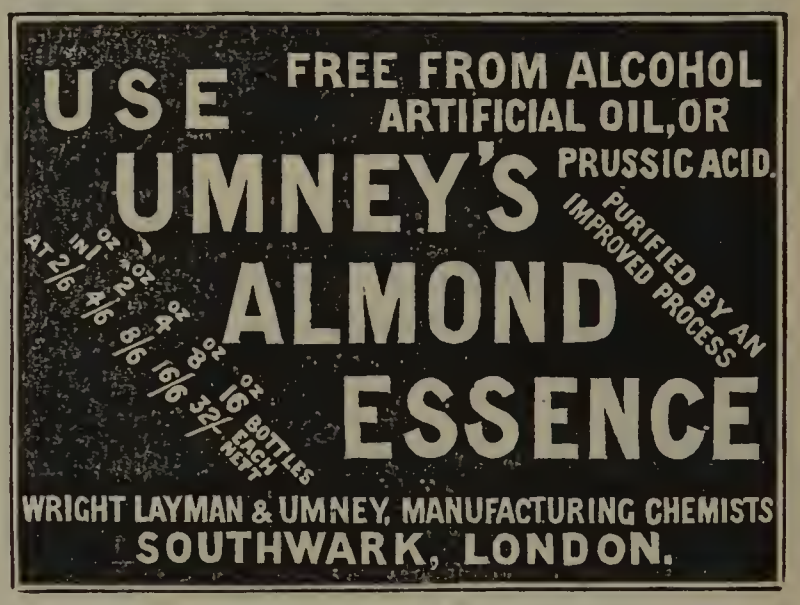

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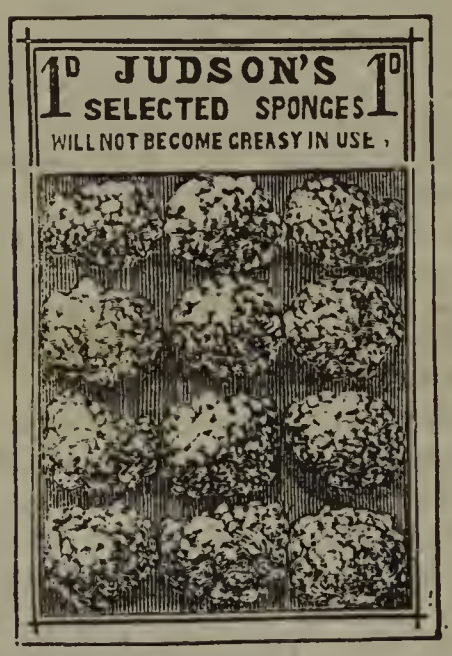

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The
Pharmaceutical Journal
AND
Transactions.

THIRD SERIES, No. 719.] SATURDAY, APRIL 5, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

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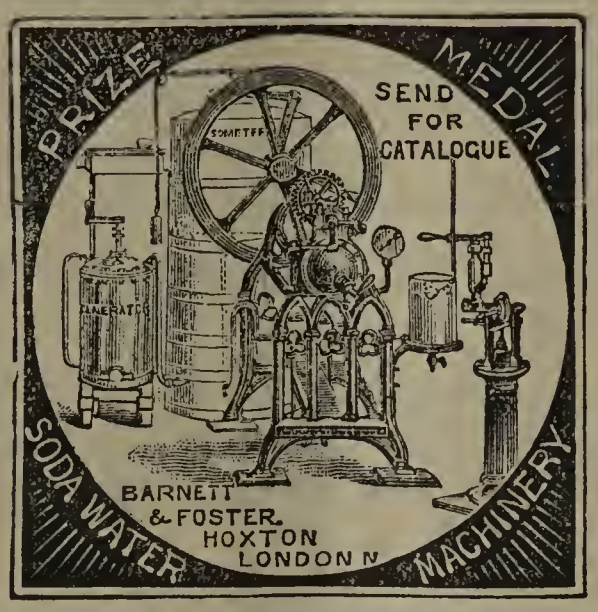

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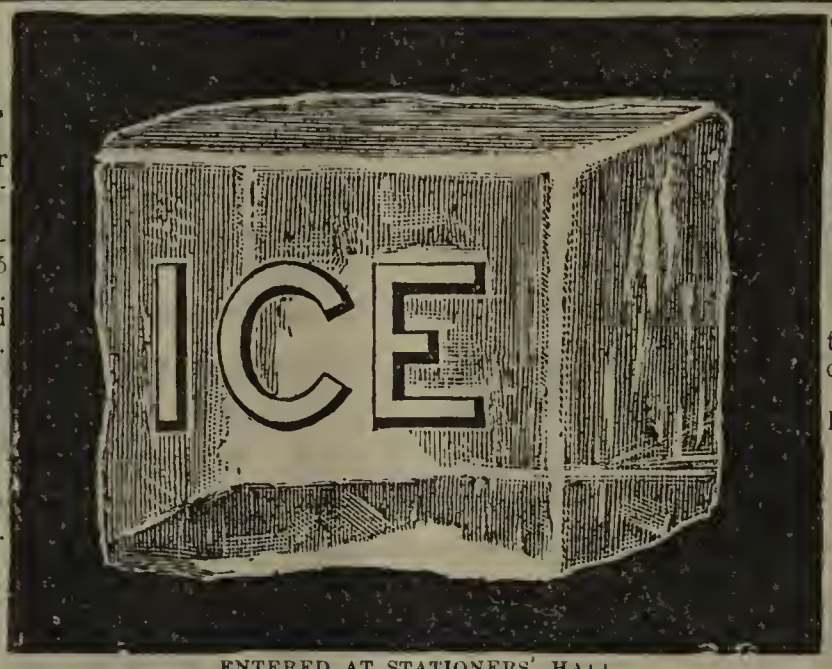

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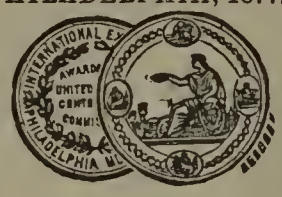

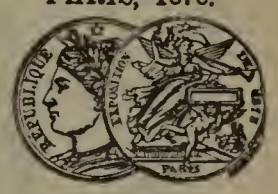

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AQUEOUS EXTRACTION OF CINCHONA BARK.*

BY PROFESSOR REDWOOD.

Among the various forms that have been devised for the administration of cinchona bark, preparations produced by aqueous extraction have always occupied a prominent position. Even since the discovery of the alkaloids, which are the only powerfully active therapeutic constituents of the bark, medical men have not been always satisfied with the use of these to the exclusion of other constituents, and therefore tincture, infusion, decoction, and fluid extract, are preparations which have been frequently employed, and from the use of which effects have resulted which the alkaloids alone have failed to produce. Where water alone is used for extracting medicinal properties from bark, as in the three last named preparations, there is a strong ground of objection to the mode of operating officially authorized in those cases, which is that a great part of the most valuable constituents of the bark operated upon is left in the marc, the menstruum used being incapable of dissolving them, and holding them in solution. This result, with reference especially to *Extractum cinchonæ liquidum* of the British Pharmacopœia, has called forth a good deal of criticism when that preparation has come under discussion; but the defects which have been pointed out and commented upon, as indicated by analyses made both of commercial samples and of samples specially prepared for the purpose, may, in several, and in all the most glaring instances, be ascribed in great part to faults other than those which essentially appertain to the process. It cannot, however, be contended that the process is a good and satisfactory one. Some of our best practical pharmacists have for some time past been seeking, or having found have been applying, processes which are said to yield better results, but unfortunately we have no published account of the investigations which have led to those results.

I have on several occasions endeavoured to induce some of my pharmaceutical friends to undertake the investigation of the best mode of preparing *liquid extract of cinchona*, with a view to publication; but, not having succeeded in that direction, I have made some experiments myself, for the purpose of testing the feasibility of obtaining aqueous extracts of cinchona better suited for use in medicine than those which are at present official.

I started with a decided opinion, founded on previous observations, as to the direction in which the investigation should be pursued, and the objects which it was most important to accomplish. They may be stated as follows:—

1. That the red, or succirubra bark is the sort most suitable for use in these operations.

2. That the extracting liquid should be water, an acid being used to render the active medicinal constituents of the bark soluble in this menstruum.

3. That the bark should be exhausted of its alkaloids in the process adopted, and that the extract should contain such other constituents of the bark as are considered to be medicinally valuable.

4. That the liquid extract should contain a specified quantity, say 5 per cent., of the mixed alkaloids of the bark.

5. That the liquid extract should admit of dilution with water without becoming turbid, and, on the other hand, that it might be evaporated to dryness without impairing its solubility to any appreciable extent.

In view of the numerous discussions that have taken place from time to time with reference to the selection and treatment of cinchona bark in its preparation for use in medicine, it will not, I think, be considered necessary that I should enter here into a detailed representation of the advantages resulting from the accomplishment of the foregoing objects. I will therefore at once describe the process I have adopted, by which those objects appear to be completely, easily and economically carried into effect.

Extract of Red Cinchona.

Take of—

Red cinchona bark, in No. 50 powder	1 pound.
Distilled water	4 pints.
Hydrochloric acid	½ fluid ounce.

Mix and macerate at a temperature of 180° F. for four hours, stirring frequently, and replacing the water that evaporates. Allow the mixture to cool; then transfer it to a percolator, and when the liquid ceases to pass, carefully introduce distilled water over the surface of the solid matter in the percolator, and continue to percolate slowly until ten pints of liquid have passed, or it is found that what is passing has ceased to give a precipitate on the addition to it of an excess of *liquor sodæ*.

Evaporate the percolated liquid, at the heat of a water-bath, until it is reduced to one pint. Let it cool, then add three pints of distilled water; stir them together while a precipitate is forming; separate the precipitate by filtration; well wash the filter and its contents with distilled water; evaporate the whole of the filtered liquid at a temperature not exceeding 180° F. until it has acquired a syrupy consistence, and dry this either in thin laminæ on the surface of glass, or in thicker masses by exposing it in shallow dishes in a drying closet.

Dissolve 20 grains of this extract in a fluid ounce of distilled water and add three fluid drachms of *liquor sodæ*. Mix thoroughly and let it stand for twelve hours that the precipitate may subside. Collect the precipitate on a filter, wash it first with distilled water rendered alkaline with *liquor sodæ*, and, finally with water alone, and when it has drained transfer it to a dish and dry it at 212° F. Its weight multiplied by five will represent the percentage of total alkaloids in the extract.

Liquid Extract of Red Cinchona.

Take of

Extract of red cinchona, as much as contains of total alkaloids.	437·5 grains
Distilled water	A sufficiency.
Rectified spirit	5 fluid ounces.

Dissolve the extract with the aid of a gentle heat in twelve ounces of the water, when cold add the spirit, make up the volume to 20 fluid ounces by further addition of water, and filter.

The principal object in this process has been the production of a liquid extract of known and uniform alkaloidal strength, which, while it possesses the aromatic flavour and astringency of the bark, is free from much inert matter, and from the peculiar extractive (chiefly quinovin) which, in our official liquid extract, forms a dense, unsightly and disagreeable precipitate when diluted with water.

* Read at an Evening Meeting of the Pharmaceutical Society, April 2, 1884.

Hitherto it has been the practice to prepare the liquid extract so that it shall bear a definite relation in volume to the weight of the bark from which it has been made; but as it is practically impossible to ensure uniformity of composition or of alkaloidal strength in the samples of bark employed, the properties of the prepared extract have necessarily differed as widely as those of the barks from which they have been obtained.

The mode of proceeding in this process admits of the use of any but the lowest qualities of the red barks of commerce. The total alkaloids contained in the dry extract produced in the first stage of the process are easily estimated, and the percentage of alkaloids being determined, while the extract itself is soluble in water, there will be no difficulty in ensuring uniformity of strength in the liquid extract. By the process as given it will contain 5 per cent. of mixed alkaloids in addition to the other constituents of the bark that are left in it. Thus a fluid ounce of the liquid extract may be considered to contain all the valuable medicinal properties of an ounce of red cinchona bark of good average quality.

It is obvious that the result indicated could not be obtained without using an acid in addition to that present in the bark, and there is no evidence that I am aware of to show that by causing alkaloids which would otherwise be wasted to combine with 9 or 10 per cent. of their weight of hydrochloric acid and thus become available for use, the efficacy of the resulting preparations would be in any way impaired

The small quantity of hydrochloric acid used in the process is sufficient to ensure the entire removal of the alkaloids from barks of average, and even more than average, quality. I have avoided the use of more than appears to be necessary, because its action with heat is said to be injurious. A slight excess of acid would be dissipated in the final concentration or desiccation to which the extract is subjected. I have ascertained that by following the instructions given the whole of the alkaloids extracted from the bark is within a small fraction contained in the dry extract in a soluble state. These alkaloids are associated in the extract and also in the liquid extract with other constituents of the bark which partake of the general character of some of the extractive matter of the *liquid extract of yellow cinchona* of our Pharmacopœia, but in one respect there is a marked difference between the two liquid extracts. There is nothing contained in the preparations made by this process that is not freely soluble in water, and therefore there is no precipitation or turbidity produced by aqueous dilution.

Having obtained several varieties of the red barks of commerce for the purpose of comparing the results obtained from them by this process, I have observed that they do not all yield the same sort of extract, arising from the fact that some are much richer in quinovin and red cinchonic than others. The thick flat varieties are the richest in those worthless constituents, while the thin young bark which, having been removed from the small branches with a spokeshave, is imported in small chips, is comparatively free from anything that causes turbidity on diluting the first concentrated extract with water.

This result, however, does not interfere with my process. The dilution would still be adopted as a safeguard, and being adopted the final results will then, as far as I have yet observed, be uniform or nearly so.

The formation of dry extract as a preliminary step towards the production of liquid extract was adopted for the purpose of facilitating the adjustment of the alkaloidal strength of the latter; but the properties of this dry extract which is soluble in water, forming a clear solution, will probably suggest its employment for other purposes, especially where the entire absence of spirit may be desired.

In the production of the liquid extract on the large scale, as well as otherwise, it is probable that manufacturers will often avoid the trouble of drying the extract, and stop the evaporation when the liquid contains the specified proportion of alkaloids, or carry it a little beyond the required point and then dilute it to what is required.

There are some experimental results connected with the subject which I have not yet had time to complete, but I have thought it desirable at once to submit the essential features of this process for medical and pharmaceutical criticism, reserving further details for a subsequent communication.

[*The discussion on this paper is printed at p.* 810.]

PROXIMATE ANALYSIS OF THE SEEDS OF AMOMUM MELEGUETA (ROSCOE).*

BY JOHN C. THRESH, D.SC.,

Pharmaceutical Chemist.

In investigating the action of various solvents, oxidizing agents, etc., upon the active principles of the fruit of the official capsicum, and of the rhizome of *Zingiberis officinalis*, I have become so convinced, from the many properties they possess in common, that they belong to a well-defined and hitherto unexamined group of proximate principles, that as leisure permits I purpose continuing their examination, and to ascertain whether other vegetable substances of a pungent character contain the same or similar principles I am now examining a number of such drugs. In some cases these have previously been only very imperfectly examined; they are therefore being submitted to proximate analysis with the view of placing the results obtained on record. As yet the examination of the so-called "grains of paradise" has alone progressed sufficiently far to form the basis of a communication to this Society. I may add, however, that I have succeeded in isolating the active principles of this drug and also of the rhizome of *Alpinia officinarum* (Hance) the "galangal" of commerce, and the very imperfect examination to which I could submit the small quantities obtained was sufficient to prove that whilst not identical with either of the principles previously mentioned and differing from each other yet that both unmistakably belonged to the same class of bodies.

Grains of paradise appear to have been analysed in 1811 by Willert, who found volatile oil, ·52; acrid resin, 3·40; extractive, 1·27; tragacanthin and woody fibre, 82·8; water and loss, 12·01 per cent. respectively Later, Sandrock found in the alcoholic extract two resins, one precipitable by neutral lead acetate, and the other not. The volatile oil, however, is the only constituent which can be said to have been examined and the result obtained by Flückiger will be found

* Read at an Evening Meeting of the Pharmaceutical Society, April 2, 1884.

in the 'Pharmacographia,' and need not be transcribed. Flückiger also exhausted 10 grams of the seed with boiling ether and obtained "·583 gram of a brown viscid residue, almost devoid of odour, but of intense pungency." This residue was soluble in glacial acetic acid and spirit of wine.

The information thus available was too meagre to permit of any deduction as to the best mode of procedure in conducting a proximate analysis, and the following preliminary experiments were therefore made.

Ten grams of the seed in fine powder were exhausted with ether (ether, B.P.). The extractive obtained weighed ·571 gram. It proved to be incompletely soluble in petroleum ether; the insoluble portion contained both resinous and astringent matter (striking a blue-black colour with ferroso-ferric salts), but was entirely soluble in spirit of wine.

Two grams of the seed were then exhausted with boiling 95 per cent. alcohol and upon evaporation ·140 gram or 7 per cent. of a soft, dark red-brown pungent residue was obtained, only partially soluble in ether.

By exhaustion with 70 per cent. alcohol 10 grams yielded (after deducting ash) ·66 gram of extractive, of which ·13 dissolved in water.

We have therefore—

Substances extracted by ether, 5·71 per cent.
Substances extracted by 95 per cent. alcohol, 7 per cent.
Substances extracted by 70 per cent. alcohol, 6·6 per cent.

I concluded from the results thus obtained that it would be best to exhaust successively with petroleum ether, dry ether, and 95 per cent. alcohol, before treating with water, etc. I am now, however, of opinion that it would have been better to have omitted the percolation with ether, as the solution so obtained was entirely soluble in alcohol and contained a considerable proportion of the astringent matter which I had hoped would have been left in the marc and afterwards taken up by the alcohol. It is an open question as to whether the tannins are absolutely insoluble in dry ether, but apparently in presence of resinous matter ether may take up no inconsiderable quantity.

For the proximate analysis of the seeds a quantity was carefully picked over and reduced to an exceedingly fine powder, by repeated grinding and careful sifting.

*Exhaustion with Petroleum Ether.** — 20 grams were placed in a flask with 100 c.c. of the petroleum and boiled for some hours, then transferred to a percolator and continuous percolation with the boiling menstruum continued for twenty-four hours. Two lots of ether were employed and as the latter was only very faintly tinted after several hours' percolation, exhaustion was deemed complete. During the ebullition a small quantity of pale yellow semi-fluid matter was deposited and from this after cooling the supernatant fluid was poured off. One-twentieth (5 c.c.) of the solution was placed in a small flask and a current of dry coal gas passed through the flask until a constant weight was attained. The flask was next kept at 100° C. until the loss of weight after fifteen minutes' further exposure was trifling. The loss is set down as essential oil, but the result is probably a little too high, for the active principle, a portion of which is present in this solution, is slowly decomposed at this temperature with continuous diminution in weight. Thus were obtained—

Volatile oil, ·63 per cent.
Total petroleum extractive, 5·09 per cent.

Volatile Oil.—My observations simply confirm those of Flückiger previously referred to.

Active Principle. — I purposely refrain from giving this substances a name until my examination of it is more advanced. Both the semi-fluid portion deposited by the petroleum and the petroleum solution were very pungent; they were, therefore, mixed and the ether distilled off. The pale yellow oily fluid upon standing deposited a very small quantity of indistinctly crystalline matter. The whole of this residue was shaken with equal quantities of petroleum ether and 70 per cent. alcohol when it entirely dissolved. The alcoholic solution, which from its pungency evidently contained nearly the whole of the active principle, was agitated with a fresh quantity of petroleum ether, and then precipitated with basic lead acetate. The bright yellow precipitate produced adhered to the side of the containing vessel and was removed by agitation with a little silica and filtration. The filtrate after treatment with H_2S was evaporated in a partial vacuum (b. h. about 360 mm.) until all or nearly all the alcohol was removed, and the residue agitated with chloroform. The chloroform solution deposits upon evaporation the active principle. It is a straw coloured, viscid, odourless fluid, pungent in taste (not nearly so hot as capsaicin, but probably hotter than the pungent principle of ginger). It is slightly soluble in petroleum ether and petroleum, very soluble even in dilute alcohol, also in benzol, chloroform, ether, carbon disulphide, glacial acetic acid and solution of potash. From the latter solution it is precipitated by CO_2 and by ammonium chloride. The KHO solution gives with $BaCl_2$, $CaCl_2$, $Mg(C_2H_3O_2)_2$ and $Zn(C_2H_3O_2)_2$, very voluminous pale yellow precipitates soluble in alcohol. Copper acetate gives a green precipitate which upon heating adheres to side of tube. It is very readily oxidized. Warm chromic acid mixture acts energetically upon it with copious evolution of carbonic acid gas and formation of two or more acids of the $C_nH_{2n}O_2$ series. Strong sulphuric acid dissolves it and if care is taken to prevent rise of temperature (which otherwise is considerable and causes carbonization and evolution of SO_2) a dark red solution is obtainable, which if poured into a large quantity of cold water yields a slightly opalescent nearly colourless solution. It readily reduces an ammoniacal solution of silver nitrate with production of a metallic mirror. Hot dilute nitric acid oxidizes it, yielding a reddish resinous mass, which by the action of solvents is found to be a mixture of two or more substances; also carbonic acid, an oily acid with odour of caproic acid, oxalic and succinic acids. Strong nitric acid acts energetically upon it, yielding a pale yellow solution miscible with water. On evaporation a crystalline residue is obtained consisting chiefly of oxalic acid together with succinic. The action of fused potash, of reducing agents, etc., has also been tried, but the results obtained need confirmation by experiment upon larger quantities of material, and are reserved for a future communication.

* The petroleum ether employed in these investigations was portion of a large fraction which came over between 40° and 44° C. upon distilling a light gas oil.

Resin Precipitated by Lead Acetate from the Alcoholic Solution.—The lead salt was decomposed by H_2S and the solution evaporated. The soft, reddish-brown resinous residue had a pungent taste. It appeared to be a mixture of the active principle and a resin. It dissolved in dilute alcohol, the solution, if not too dilute, precipitating with neutral lead acetate. With basic lead acetate it gave a copious yellow precipitate, the lead salt not passing into solution when shaken with petroleum ether. This resinous matter corresponded to about ·5 per cent. of the seed.

The petroleum solution was distilled to remove the ether and the residue dissolved in a little glacial acetic acid. Upon adding a few drops of water and warming, the essential oil separated and floated on the acid. The latter upon cooling became almost solid from deposition of what appeared to be a granular fat. This was removed, and the following properties noted. Melting point (about) 80° F.; upon cooling it had an indistinctly crystalline, pale brown, fatty appearance; very readily soluble in ether, petroleum ether, carbon disulphide, chloroform, benzol, acetic acid and rectified spirit. It has a slightly acid reaction and dissolved in warm 50 per cent. alcohol, in hot solution of sodium carbonate and in solution of potash; in the two latter cases with production of an orange colour. With neutral lead acetate it yields a white precipitate, with the basic acetate a yellow precipitate, which dissolves instantly when shaken with petroleum ether to an orange solution. Upon evaporation this leaves a bright yellow varnish-like residue.

This principle, which I hope to further examine, constitutes about ·80 per cent. of the seeds.

Extraction with Dry Ether.—The percolator containing the marc exhausted with petroleum ether was attached to a filter pump and a current of dry air drawn through to remove the petroleum still remaining in the residue. Ether (specific gravity ·717) was then poured on and after two days' digestion continuous percolation with boiling ether was conducted for about eight hours. The pale yellow solution thus obtained was partially distilled, the remainder of the ether driven off in a current of air at a low temperature, and then exposed for a few minutes to the heat of a water-bath.

The residue corresponded to 1·42 per cent. of the original seed, and was resinous, soft, slightly pungent, pale brownish-yellow and odourless. Treated with carbon disulphide or petroleum ether, a very small portion only was dissolved and this proved to be in the latter case a trace of the active principle which had escaped the previous action of this solvent. It was entirely soluble in rectified spirit, and the solution precipitated copiously with neutral lead acetate. The precipitate was collected, decomposed by H_2S, the solution (alcoholic) evaporated and the residue weighed. It corresponded to ·56 per cent. of the drug. It undoubtedly consisted of a tannin associated with a little resinous matter, difficult to separate. It was amorphous, hard, brittle, red-brown and formed with water an opalescent solution. Soluble in dilute alcohol, and in ether, B.P., but almost unaffected by pure ether, benzol, carbon disulphide and chloroform. Ammonia did not readily dissolve it, but with potash it yielded a rich red solution, and partial precipitation ensued upon addition of ammonium chloride to this solution. In aqueous solution ferroso-ferric salts struck a blue black colour, barium hydrate gave a blue precipitate, silver nitrate and ammonia a black precipitate instantly. It precipitated gelatine solution, and solution of cinchonine salts and reduced Fehling's solution. All attempts to obtain any crystalline bodies by treatment with ether, acetic ether, etc., and careful evaporation were unavailing.

The portion of the ethereal extract insoluble in boiling petroleum ether and not precipitated by lead acetate was devoid of pungency and consisted of resinous matter with probably some decomposition products of the tannin. By action of benzol it could be divided into two portions, the one soluble, the other insoluble therein. Both were unaffected by water, but soluble in solution of the fixed akalies and in glacial acetic acid and in chloroform. The former also dissolved in solution of ammonia and in carbon disulphide; the latter was unaffected by both.

Exhaustion with 84 per cent. Alcohol.—The percolator containing the marc from the ether treatment was again attached to the filter pump, and after removal of the ether, rectified spirit was passed through to exhaustion. 100 c.c. of a pale yellowish tincture were thus collected. 20 c.c. upon evaporation to dryness left a residue weighing ·040 gram, and upon ignition this yielded ·003 gram ash. The combustible matter, therefore, taken up by the spirit represents ·93 per cent. of the seeds employed. The red-brown brittle residue left on distilling off the spirit under diminished pressure had a faintly astringent taste. The portion soluble in water was estimated, and in its properties found to coincide closely, but not entirely, with the astringent matter found in the ethereal extract. It only precipitated gelatine distinctly after addition of common salt, and it did not give instantly a black precipitate with ammoniacal solution of silver nitrate, but it rapidly reduced it when heated therewith. I am inclined to think there are two distinct astringent tannin-like bodies present in the seeds, but it is not improbable that the differences observed may be due to impurities associated therewith.

The portion of the alcoholic extract not dissolved in water was almost completely soluble in very dilute ammonia, yielding a red-brown solution. When heated it did not melt, but gave off a disagreeable odour and burnt with a luminous flame, leaving a voluminous char. The precipitate produced by addition of an acid to the alkaline solution, when dry was almost black, and not completely soluble in rectified spirit. Quantitative estimations of an aliquot part of the alcoholic extract gave the following results:—

Astringent matter	·43 per cent.
Phlobophane	·50 ,,
Matter insoluble in water, ammonia and spirit	·07 ,,

Exhaustion with Cold Water.—The marc left after exhaustion by petroleum ether, ether and alcohol was now transferred to a beaker and dried at a low temperature. 200 c.c. of water were then added and the mixture stirred from time to time for two days. The liquid was neutral, colourless, tasteless, and though limpid it filtered very slowly. 10 c.c. of the filtrate yielded ·0225 gram of dry residue, containing ·0035 gram ash.

The mucilage was determined in the usual manner, and after removal of the alcohol in the filtrate from mucilage precipitate the organic acids present were precipitated by lead acetate and estimated by igni-

tion of the precipitate. The aqueous solution did not reduce Fehling's solution until after ebullition with acids, but appeared to contain an appreciable amount of nitrogenous matter.

The aqueous infusion when evaporated on the water-bath deposited flocks of nitrogenous matter which refused to redissolve in water. Mixed with one-fourth its volume of a saturated solution of salt it at once became turbid and slowly deposited a white flocculent matter. Addition of more salt, of acid or of water again dissolved it. The infusion was also coloured brown by iodine, and precipitated with ferrocyanide of potassium and acetic acids.

The total aqueous extract (— ash) was made up of—

Mucilage	·22 per cent.
Organic acid, etc., precipitated by lead acetate	·38 „
Albumenoid	1·3 „
Total	1·9 „

From the difficulty in effecting filtration of the infusion and the fact that it frothed readily and precipitated copiously with barium hydrate, a special search for saponin or an allied body was conducted, but with negative results.

Exhaustion with ·2 per cent. Caustic Soda Solution.—After decanting and filtering the aqueous infusion the residue was digested in ·2 per cent. solution of caustic soda for twenty-four hours. The solution thus obtained filtered easily, and a portion was precipitated with acetic acid and alcohol and the metarabin and ash estimated. Upon evaporating the filtrate the residue was found to weigh less than the sodium acetate which should have been present. Titration of a portion of the alkaline solution proved that about two thirds of the caustic soda used had been taken up by the insoluble vegetable matter.

Estimation of Starch.—The residue which had been treated with dilute alkali was boiled with 200 c.c. of water, and digested with a little fresh diastase in the usual manner, and when the action was completed an aliquot portion was filtered off, acidulated with hydrochloric acid, boiled for four hours and the sugar finally determined with Fehling's solution. The glucose found corresponded to 27·3 per cent. of starch in the original seed.

Pararabin.—After removal of the starch the residue was boiled with 1 per cent. hydrochloric acid and in the filtrate the pararabin estimated. It corresponded to 3·12 per cent. of the seed employed.

The acid solution was dark brown in colour and much more of the constituents of the seed had been dissolved (probably only after decomposition) than was afterwards precipitated by alkalies.

Cellulose.—The residue from the above treatment was finally digested with warm dilute nitric acid (sp. gr. 1·18), to which a little potassium chlorate was added, and the colourless insoluble portion collected on a filter and washed successively with water, dilute ammonia, and alcohol, dried and weighed. The amount of cellulose thus obtained was 1·13 gram.

Moisture and Ash.—Two determinations of the moisture were made by exposing the finely ground seeds in a hot air oven to a temp. of 110° C., until there was no further loss of weight.

1·292 grams lost . . . ·333 or 16·7 per cent.
2·195 grams lost . . . ·368 or 16·8 per cent.

deducting ·6 per cent. for volatile oil, we have as mean of both experiments—

Moisture . . . . . 16·15 per cent.

The ash was determined by burning the portion first dried in a platinum crucible in a kind of muffle. The ash was of a pale brown colour, and weighed, ·0668 gram corresponding to 3·36 per cent. of the undried seed.

My assistant (Mr. Thornton) examined the ash from a larger quantity of seed and obtained the following results:—

Ash soluble in water	·60 per cent.
Ash soluble in acid	1·30 per cent.

The remainder (1·44 per cent.) consisted chiefly of sand.

The soluble ash was only faintly alkaline and did not effervesce perceptibly with acids. It consisted almost entirely of potassium and sodium sulphates.

The portion soluble in hydrochloric acid consisted of the phosphates of calcium and aluminium and magnesium, with large traces of manganese and iron.

Albumenoids.—The nitrogen in 1·487 gram of the seed was determined by the method of Will and Varrentrap. The platinum obtained weighed ·0905 gram, corresponding to ·86 per cent. of nitrogen in the undried seed. This may be regarded as equivalent to 5·4 per cent. of albumenoids.

Tabulated Results of the Analysis.

Soluble in Petroleum Ether.	Volatile oil	·63
	Active principle.	3·39
	Resin	·50
	(?) Acid	·80
Soluble in Alcohol.	Tannin	·99
	Phlobophane.	·50
	Resins	·63
Soluble in Cold Water.	Mucilage	·22
	Organic acids, etc, precipitated by lead acetate	·38
	Albuminoid	1·30
Taken up by successive treatment with dilute alkali; boiling water and dilute acids.	Metarabin	·79
	Starch	27·30
	Pararabin.	3·12
	Albuminoids not soluble in water	4·10
	Other substances taken up by acid	6·59
Lignin, etc.		23·70
Cellulose		5·65
Ash		2·36
Moisture.		16·05
		100·00

SAPONIN FROM SAPONARIA OFFICINALIS.*

BY C. SCHIAPARELLI.

The analyses hitherto made of saponin obtained from different plants are not very concordant, the results varying indeed from 47·52 per cent. C. and 7·16 H. (Overbeck) to 52·63 C. and 7·48 H. (Rochleder and Schwarz). Moreover the experiments of the last-named chemist lead to the conclusion that the carbohydrate obtained in the first instance from saponin by decomposition with acids, is not grape-sugar, but a body convertible into that sugar by the further action of acids,—and consequently that saponin is not a glucoside but an amyloid. To throw further light on this matter, the author has endeavoured to determine whether the products extracted from different plants and included under the name of saponin, are really identical, and in the present paper he describes the results obtained with saponin from *Saponaria officinalis*.

The root of this plant, dried and coarsely pounded,

* From *Gazzetta*, xiii., 422-430. Reprinted from the *Journal of the Chemical Society*.

was boiled for three days in a reflux apparatus with alcohol of 90°; after which the boiling alcoholic decoction was separated and left for some days in a cool place, whereupon the sides of the vessel became coated with a copious yellow flocculent deposit which, when freed from colouring matter by treatment with a warm mixture of alcohol and ether, consisted of saponin, still, however, very impure. Treatment with alcohol and animal charcoal still left it contaminated with about 3 per cent. of mineral matter. It was, therefore dissolved in the smallest possible quantity of water; the cold solution was precipitated with saturated baryta-water; the resulting barium saponate, after washing with baryta-water, was suspended in water and decomposed by a current of carbonic anhydride, then heated to the boiling point, and filtered; the filtrate evaporated to a syrup at a gentle heat was precipitated with alcohol; and the still yellowish saponin was further purified with alcohol of 90 per cent. The substance thus obtained still contained barium salts, to remove which it was dissolved in water and treated with dilute sulphuric acid, added drop by drop; and the filtered liquid, after concentration at a gentle heat, was precipitated with alcohol and ether, these operations being repeated a second and a third time, and the product finally purified with boiling alcohol of 90 per cent. in quantity not sufficient to dissolve it completely. The alcoholic solution evaporated in a vacuum left perfectly white flocks of pure saponin, which were washed with ether and dried over sulphuric acid.

Saponin thus prepared gave, as the mean result of five analyses, 52·65 per cent. carbon and 7·36 hydrogen, agreeing nearly with the formula $C_{32}H_{54}O_{18}$, which requires 52·86 C. and 7·44 H. Saponin from *Gypsophila* was found by Rochleder to contain 52·65 carbon and 7·34 hydrogen.

Pure saponin is a very white amorphous inodorous powder, which excites sneezing when inhaled by the nostrils; it has a pungent disagreeable taste, and is poisonous; dissolves very freely in water, but is insoluble in ether, benzene, and chloroform, and only slightly soluble in alcohol. Heated on platinum foil, it decomposes, emitting an odour of burnt sugar, and leaving a porous residue difficult to burn. Saponin is lævogyrate, like most glucosides; specific rotatory power $[\alpha]_D = -7·30$: it is the least optically active of all known glucosides.

Saponin, as already observed, is remarkable for the power of its aqueous solution to dissolve salts which are insoluble in water. When its aqueous solution, mixed with lead acetate, is precipitated by hydrogen sulphide and filtered the liquid which passes through is black from dissolved lead sulphide, which may be precipitated from it by adding a small quantity of alcohol. A boiling aqueous solution of saponin dissolves barium carbonate (up to 10 per cent.), which may be precipitated by sulphuric acid; nevertheless barium sulphate is slightly soluble in aqueous saponin. This property of dissolving salts throws great difficulty, as already observed, in the way of purifying saponin. This substance likewise dissolves gases and incloses them mechanically. A dilute aqueous solution of saponin forms on agitation a very persistent froth.

An aqueous solution of saponin mixed with hydroxide of potassium, barium, or strontium, yields precipitates of the corresponding compounds. The barium compound has the composition—

$$C_{32}H_{53}O_{18}.BaC_{32}H_{52}O_{18}.BaC_{32}H_{53}O_{18}.$$

Products of Decomposition of Saponin.—An aqueous solution of saponin was heated on a water-bath with dilute sulphuric or hydrochloric acid, the liquid being filtered after two hours, in order to remove the flocculent substance which separated, and thereby prevent its further decomposition by the acid; the filtered solution was then again boiled, the new precipitate separated, and these operations were repeated a third time. The three precipitates thus obtained agreed very closely in composition, giving as the mean result of their analysis, 60·65 per cent. carbon and 8·22 hydrogen, numbers agreeing nearly with the formula $C_{40}H_{66}O_{18}$, which requires 61·06 carbon, 8·38 hydrogen, and 3·56 oxygen. The decomposition of saponin by dilute acids may therefore be represented by the equation—

$$2C_{32}H_{54}O_{18} + 3H_2O = C_{40}H_{66}O_{15} + 4C_6H_{12}O_6.$$

The compound $C_{40}H_{66}O_{15}$ is called by the author saponetin, to distinguish it from the *sapogenin* of Rochleder and others, which was not of constant composition. Saponetin is a whitish microcrystalline substance, insoluble in water, alcohol, and ether.

The glucose formed by the action of dilute acids on saponin is dextrogyrate, its specific rotatory power being $[\alpha]_D = +52·48$. It is fermentable, has a saccharine taste, and has not yet been crystallized, its solution, after concentration to a syrup, having remained for six months without giving any sign of crystallization. Further experiments are, however, required to determine whether it is a peculiar sugar distinct from dextrose, or whether the difference between its optical rotatory power and that of the latter is due to some other cause.

HYDROCYANIDES OF ORGANIC BASES.*

BY A. CLAUS AND E. A. MERCK.

Aniline, toluidine, quinine, cinchonidine, and strychnine, dissolve in aqueous hydrocyanic acid. An excess of acid renders the solution very unstable. The salts have not been isolated, as they are decomposed by evaporation in a vacuum. Although the bases are completely withdrawn from these liquids by ether, the solutions are not mere mechanical mixtures, since they yield double cyanides with mercuric cyanide; *e.g.*, when mercuric cyanide is added to a solution of aniline hydrocyanide, white tabular crystals, $NH_2Ph,HCN + Hg(CN)_2$, are deposited, which dissolve in water, alcohol, and ether.

When mercuric cyanide is added to tetramethylammonium iodide, two salts are formed, viz., a white salt of the composition $NMe_4I,Hg(CN)_2$, freely soluble in water, and a yellow salt, $NMe_4.CN,HgICN$, sparingly soluble in water. The white salt slowly changes into the yellow isomeride at the ordinary temperature, more rapidly at 200°.

Tetramethylammonium cyanide, $NMe_4.CN$, prepared by the action of barium cyanide on tetramethylammonium iodide, has been described by C. Thompson. The clear crystals of the salt become opaque at 150°, decrepitate at 215°, and melt at 295°. The salt can be volatilized at 225–230° without melting. With mercuric cyanide it forms a double salt, $NMe_4.CN,Hg(CN)_2$, crystallizing in prisms melting at 275°. The corresponding silver salt, $NMe_4.CN,AgCN$, has been described by Thompson. Tetramethylammonium cyanide dissolves cobalt cyanide and ferrous cyanide, forming tetramethylammonium cobalticyanine and ferrocyanide respectively. The latter compound has been described by Barth (*Ber.*, viii., 1484). The former crystallizes in yellow plates, and resembles the potassium cobalticyanide in its properties.

Cinchonidine ethylcyanide, $C_{19}H_{22}N_2O,EtCN$, prepared by the action of barium cyanide on cinchonidine ethylsulphate, forms white crystalline needles, which are decomposed by carbonic acid, and rapidly absorb moisture from the air. It is soluble in water but insoluble in ether and chloroform. The crystals melt with decomposition at 140°. *Quinine ethylcyanide*, $C_{20}H_{24}N_2O_2,EtCN$, crystallizes in needles soluble in alcohol. The crystals melt at 90° and begin to decompose at 95°. *Strychnine ethylcyanide*, $C_{21}H_{22}N_2O_2,EtCN$, is less hygroscopic and more stable than the quinine and cinchonidine compounds. It dissolves freely in water, but is less soluble in alcohol.

* From *Ber.*, xvi., 2737–2748. Reprinted from the *Journal of the Chemical Society*.

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Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

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PHARMACISTS AND THE PHARMACOPŒIA COMMITTEE.

THE announcement made in a recent number of this Journal that the Medical Acts Amendment Bill, as reintroduced by the Government into the House of Lords, contained the previous provisions as to the preparation of future editions of the British Pharmacopœia in an unaltered form, will have prepared our readers for the tone of some correspondence with the Privy Council department which was submitted to the Council of the Pharmaceutical Society at its meeting on Wednesday last, and is printed on page 809. It was hardly to be hoped that the omission of the Government to respond to the reasonable request of the pharmacists of Great Britain and Ireland that provision should be made to give them a proper position in future pharmacopœia committees, backed as it was by the presentation to the House of Commons last August of upwards of two hundred and fifty petitions, bearing more than four thousand signatures, could have been the result of oversight or inadvertence. Nevertheless, as the Lord President of the Council had intimated in his place in the House of Lords that it was his intention to move some amendments whilst the Bill was in Committee, the President of the Pharmaceutical Society took the opportunity of inquiring by letter whether it was intended to include among those amendments one providing for the formation of a Pharmacopœia Committee including pharmaceutical chemists as well as medical practitioners. The reply was simply an expression of regret that the Lord President did not see his way to amend the Medical Acts Amendment Bill in the manner suggested.

This reply evidently left to the Pharmaceutical Council the alternative of retreating from the position it has taken up in respect to this question, or of making an attempt to impress its views upon Parliament more effectively than it had upon Her Majesty's ministers. As to which course the Council would decide to adopt there could be little doubt, and we believe that the members of the Society will, almost without exception, approve of the instruction given to the Law and Parliamentary Committee to take such steps as it may deem advisable to secure the amendment of the Bill in the direction desired before it passes into law The particular steps that will be found desirable are as yet uncertain and will require most careful consideration; but meanwhile the field in which they can be taken has become more circumscribed, since during the past few days the Bill has been pushed through its remaining stages in the House of Lords and on Thursday it was read a third time and sent down to the House of Commons. Probably its first reading in that assembly will take place early next week; but in the present state of public business the succeeding stages are very uncertain. We presume, however, that an effort will be made to ensure that on the occasion of the second reading the case of pharmacists shall, in some way, be laid before the House of Commons, but presumably the principal effort will have to be made when the Bill is in Committee. It will, therefore, almost certainly become necessary to call upon the local secretaries and other friends to repeat the good work done last year in securing the filling up of petitions from their respective localities and arranging for their presentation when they receive an intimation that the proper time has arrived. Meanwhile every opportunity should be taken by all chemists and druggists to lay before any members of Parliament whom they may be able to approach a clear statement of the nature of the amendment which it is proposed to effect in the Bill, and to point out that the privilege for which British and Irish pharmacists are asking is one already possessed by the corresponding class in almost every other civilized country and has everywhere been acknowledged by the medical profession to be of material benefit. If the question were once properly comprehended by the members of the Legislature there would hardly be a doubt as to the result; whilst, on the other hand, the dread of interfering without the requisite special knowledge in a technical dispute may induce many to follow blindly what might appear to them authoritative guidance. In the words of Mr. HAMPSON, what is wanted is not so much to exercise pressure upon the Government, as to show the House of Commons that this claim put forward by pharmacists and supported by many medical practitioners is a just and reasonable one. Very few of our readers need now to be informed as to the conditions under which the most important national pharmacopœias other than our own are prepared; but in the event of anyone wishing to refresh his memory as to the facts, he will find them epitomized in an article that appeared in this Journal exactly a year ago. It would, however, seem to be worthy the consideration of the Law and Parliamentary Committee whether it might not be advisable to draw up and issue, in a pamphlet form, a brief statement, suitable for conveying information on the chief features of the subject succinctly to the minds of members of the Legislature and others whom it may be desired to interest.

In conclusion, reference may be made to the fact

that at the sitting of the Medical Council on the 27th ult., a report was presented from the Pharmacopœia Committee as to its proceedings since April in last year. From this we learn that "the "arrangements for the preparation of the next "edition of the Pharmacopœia have been continuous; "the Sub-Committee has met on four occasions and "has been in communication with the editors per-"sonally and by written reports." Mention is made of a "memorandum" that has been issued to various medical authorities, pharmaceutical bodies and gentlemen holding prominent positions as practical pharmacists and manufacturing chemists, and it is stated that in reply many valuable suggestions have been received for which the thanks of the Medical Council are due. The pharmacists and manufacturing chemists mentioned by name as having afforded valuable information for which the Committee is very much indebted are Messrs. J. B. Barnes, London; W. Inglis Clark, D.Sc., for Duncan, Flockhart and Co., Edinburgh; S. Gale, for John Bell and Co., London; D. Howard, for Howard and Sons, Stratford; F. J. Macfarlane and Co., Edinburgh; B. S. Proctor, Newcastle; J. C. Thresh, D.Sc., Buxton; Thomas Farries, for Burgoyne, Burbidges, Cyriax and Farries, London; John Moss, for Stagg, Harker and Moss, London; F. W. Fletcher, Edinburgh; and T. and H. Smith and Co., Edinburgh. Many of the suggestions made are said to have been previously anticipated, but all the communications have been handed over to the "skilled editors" for their consideration, and the Committee expresses itself satisfied that the information already in their hands will be sufficient to render the next edition of the British Pharmacopœia worthy of the approval of the Council and the profession. This statement seems to suggest that a considerable advance has been made in the preparation of the new work, and is in accordance with a rumour that it will make its appearance in the early part of next autumn.

EXAMINATION STATISTICS.

The proportion of candidates who fail to pass the examinations under the Pharmacy Act will naturally always be scanned with interest, lest an undue degree of stringency may involve a corresponding amount of hardship. Especially is this interest apt to acquire a tinge of uneasiness when, as is sometimes the case, the proportion of rejections attains a very high figure. It is therefore useful, when opportunity occurs, to note the "pass and pluck" statistics of other bodies, in order to see how far the experience is common to different examinations. Such an opportunity is afforded by the publication of some statistics presented to the Medical Council during its recent session. First in order, as dealing with the earliest stage, may be mentioned a communication from the College of Preceptors, giving the results of the Preliminary examination for medical students and others, under its superintendence, in September last. From this we learn that out of 264 candidates who were examined in London and other centres only 82, or rather less than one-third, succeeded in obtaining certificates qualifying for registration as medical students. Of the remainder, 20 passed in all the obligatory subjects, but failed to obtain the minimum number of marks to entitle them to be placed in the second division of the second class, as required by the regulations of the Medical Council. As to those who were unsuccessful in obligatory subjects, 61 failed in one, 25 in two, 26 in three, and 33 in four or more. Thirty-two candidates were reported for defective spelling, and one was disqualified on that account alone. This proportion of failures, it is needless to say, is considerably larger than the average of failures among candidates in the pharmaceutical Preliminary examination.

Advancing to the next stage, we may refer to a return which was presented showing the percentage of successful and unsuccessful candidates amongst all who presented themselves at the different medical examining boards in the three kingdoms during the year 1883. From this document it appears that the total number of candidates who presented themselves at the first professional examinations was 4171, of whom 2579, or 62 per cent., passed, and 1592 were rejected. In the second examinations the proportion of passes was a little higher, for out of 1239 candidates 815, or nearly 66 per cent. were successful. The third examinations showed still more decided indications as to the quality of the class that had been previously eliminated, for in these the proportion of successful candidates rose to 71 per cent., the number being 2700 out of 3802. As compared with the average results attending the Minor pharmaceutical examination the proportion of passes in each of these medical examinations, taken individually, seems to be more favourable; but if it be remembered that in the latter case the single Minor examination is all that a candidate has to pass, after the Preliminary examination, to entitle him to registration as a fully qualified chemist and druggist it will be seen that the discrepancy is more apparent than real.

Another point which has occasionally been the subject of discussion among pharmacists was illustrated by some volunteer statistics presented to the Medical Council by Dr. Aquilla Smith, showing the relation which the proportions of candidates successful in the examinations of the present day bear to those which obtained in former years. Some of these figures are rather remarkable, since they show that medical examining boards, in some instances, last year rejected two and three times as many candidates in proportion to those who passed as in the year 1867. It is true that, in some instances, it might be objected that possibly passing events may be exercising more or less temporary influence on the stringency of the examinations

but it is somewhat striking to find that last year the percentage of rejections by the Royal College of Physicians, London, was 20 per cent., against 11·2; and the percentage of rejections by the Royal College of Surgeons, England, 36·7 per cent. in 1883, against 12 per cent. in 1867. Although probably to produce this result several distinct causes have contributed, important amongst which it may be assumed stand the wider demands of the examiners in view of the enormous strides taken by science in the last quarter of a century, the force of Dr. AQUILLA SMITH'S remark must be admitted when he says that the large proportion of candidates rejected by the College of Preceptors, considered in conjunction with the large proportion of failures in the primary professional examinations, furnishes unmistakable evidence that there is a great defect in the primary education of young men of the class that seek to enter the medical profession.

The goodly list of Stewards published on another page, numbering about one hundred and fifty names, is a promising indication that on the occasion of the Annual Dinner of the Members of the Pharmaceutical Society and their friends, on the 20th of next month, the President will have the support of a large number of leading pharmacists. This is as it should be, for although these *réunions* were primarily initiated with a view of facilitating social intercourse between the members of the Society resident in London and those who come up from the country to attend the annual meetings, they furnish admirable opportunities for demonstrating the practical unity of the body of pharmacists at important crises like the present. We would recommend in order to promote those arrangements that are so essential to the general comfort at such gatherings that persons intending to be present should make an early application for tickets to the Honorary Secretary, Mr. Richard Bremridge.

* * *

In the House of Commons, in reply to a question put by Mr. Warton, on Thursday, Mr. Mundella stated that the Government Bill relating to the sale of poisons will be introduced in the House of Lords after Easter.

* * *

A report that will be found on another page incidentally illustrates the position which no inconsiderable number of chemists and druggists take towards every attempt at the organization and improvement of the body to which they belong. A Mr. Gibson, carrying on business as a chemist and druggist in Southampton, having in the course of evidence given at an inquest stated that he was a registered chemist and druggist, the coroner, having consulted the Register without finding a corresponding entry, called his attention to the fact, when Mr. Gibson offered the explanation that he was registered as living at Middlesborough-on-Tees. Upon the coroner asking him, very pertinently, whether he did not consider it his duty to see that his address in the Register was corrected now that he was residing in Southampton, he is reported to have replied that "that was for the Local Secretary who assisted in compiling the book to see to." Why Mr. Gibson should assume that it is the business of an honorary official of a Society from which he has hitherto held aloof to attend to business that concerns himself alone, we are unable to understand, though we prefer to attribute it to some misapprehension. However this may be, it is certain that if his neglect to keep the Registrar under the Pharmacy Act informed as to any changes of residence he may make results at some time in his name being struck off the Register, he will have himself only to thank for any inconvenience that may follow. Since a question is said to be frequently raised as to what the Pharmaceutical Society does for the trade, we may mention, as a contribution towards answering it, that a few days ago upwards of seven hundred registered letters were sent out, at the Society's expense, to persons whose place of residence was suspected to be no longer represented by the entry in the official Register, and that the greater number of these have already been returned through the Dead Letter Office.

* * *

A paragraph in the current number of the *Journal de Pharmacie* calls attention to the fact that the poisonous variety of star anise derived from *Illicium religiosum*, Sieb., has been detected in the stock of a herbalist in Paris, and that its use is known to have already been followed by serious consequences in two cases at least in that city. As, therefore, it would appear that parcels of this dangerous drug are still met with in commerce, it may be useful to remind our readers that the "star anise" from different species of *Illicium* have been described and figured in an article by Mr. E. M. Holmes, which appeared in the number of this Journal for December 18, 1880.

* * *

In connection with the International Health Exhibition arrangements have been made for the establishment of a library and reading room, which are to be located in a large double room in the Albert Hall, overlooking the Conservatory. It is intended that the library shall contain a representative collection of literature on vital statistics and public health, and that the reading room shall be supplied with the current numbers of periodical publications of a sanitary or educational character. Foreign powers and the Indian and Colonial Governments have been invited to assist in making this department of the exhibition as complete as possible and a general request is made to authors and publishers to contribute copies of works treating of cognate subjects.

* * *

A meeting of the London Section of the Society of Chemical Industry will be held on Monday evening next, at 8 p.m., in the Chemical Society's rooms, Burlington House. The first business will be the election of the Local Committee. Afterwards, papers will be read on "Certain Bye-Products of the Pintsch Oil-Gas Manufacture, in Relation to the Conditions under which Benzenes are formed," by Dr. Armstrong; "The Estimation of Sulphurous Acid in its Compounds," by Messrs. Giles and Shearer; and "The Solidification of Liquid Oils," by Mr. W. J. Carpenter.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, April 9, at 9 p.m. precisely, when a paper on "Operative Dentistry" will be read by Dr. Albert J. Kutz.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, April 2, 1884.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Symes, Williams, and Young.

The minutes of the previous meeting were read and confirmed.

Nominations for Council and Auditors.

Council.

The Secretary reported that he had received *twenty* nominations to fill the *fourteen* vacant seats on the Council and that the following *eighteen* had declared their willingness to accept office if elected:—

Atkins, Samuel Ralph, Market Place, Salisbury.
Baldock, John Henry, 3, High Street, South Norwood, S.E.
Borland, John, 7, King Street, Kilmarnock.
Butt, Edward Northway, 13, Curzon Street, Mayfair, W.
Churchill, Walter John, 46, New Street, Birmingham.
Dyer, William, 1 Corn Market, Halifax.
Gostling, Thomas Preston, Market Hill, Diss.
Greenish, Thomas, 20, New Street, Dorset Square, N.W.
Radley, William Valentine, 42, Hampton Road, Southport.
Robbins, John, 147, Oxford Street, W.
Savage, William Dawson, 4, Park Road East, Brighton.
Schacht, Geo. F., 52, Royal York Crescent, Clifton, Bristol.
Shapley, Charles, 11, Strand, Torquay.
Squire, Peter Wyatt, 413, Oxford Street, W,
Williams, John, 16, Cross Street, Hatton Garden, E.C.
Woolley, George Stephen, 69, Market Steeet, Manchester.
Young, James Robertson, 17, North Bridge, Edinburgh.
Young, John Rymer, 42, Sankey Street, Warrington, Lancs.

The following *two* had declined to accept office:—

Allen, Charles Bowen, 3, Manchester Ter., Kilburn, N.W.
Pickering, Atkinson, 45, Lowgate, Hull.

Auditors.

The following had been nominated as Auditors for the ensuing year, and had declared their willingness to accept office if elected, except Mr. Thompson, who does not seek re-election:—

Hodgkinson, William, 198, Upper Whitecross Street, E.C.
Lescher, Frank Harwood, 60, Bartholomew Close, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Thompson, Henry Ayscough, 22, Worship Street, E.C.
Watts, William Manning, 32, Lower Whitecross St., E.C.

The President said he was sure the Society would be sorry to lose the services of Mr. Ayscough Thompson as auditor, but in consequence of his eyesight not being so good as formerly, and the increased work of the audit, he felt that it was proper to retire. It was the duty of the Council in these circumstances to nominate someone in his place, and he would therefore, on the suggestion of Mr. Thompson himself, nominate Mr. Hopkin, 16, Cross Street, Hatton Garden.

The nomination was unanimously acceeded to, and the thanks of the Council accorded to Mr. Ayscough Thompson for his valuable services.

Elections.

Chemist and Druggist.

Joseph Hobley, of Llanberis, a chemist and druggist, registered as being in business on his own account before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society.

Allen, Frederick Charles.....Walsall.
Charles, Thomas .....Hanley.
Constance, Herbert Edward ...London.
Crofts, John Ernest.....Birkenhead.
Francis, William Henry .....London.
Graham, Robert .....Paisley.
Hutchin, William Francis W...Saffron Walden.
Keeling, Arthur Gadsby .....Walthamstow.
Neale, John .....King's Lynn.
Smith, John Henry .....London.
Tilley, Joseph .....Bristol.
Wardle, Thomas .....Burslem.
Wilcock, John ... .Lancaster.
Wrack, Frederic George.....Bridlington.

ASSOCIATES.

The following, having passed the Minor examination and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Arthur, Samuel .....Redruth.
Collen, William Cresswell .....London.
Hill, Charles Walter .....Leeds.
Jackson, Frederick .....Manchester.
McLanachan, John .....Sheffield.
Ray, Charles .....Eastbourne.
Sapsed, William George... .....London.
Shannon, Robert James .....Birmingham.
Stewart, Alexander Kennedy...Kilmarnock.
Taylor, Edward .....Tonbridge.
Thwaites, Frederick.....Bishop Auckland.
Tupholme, Frank.....London.
Wilkinson, Robert .....Kirkham.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Baker, Sydney John .....Exeter.
Berridge, Oliver Gillett .....Leicester.
Bloomer, Joseph .....Cradley Heath.
Bowie, George ..... Aberdeen.
Brown, Frederick Edward .....Ipswich.
Capell, James Ralph .....Kettering.
Clarke, Charles Henry.....London.
Golding, Frank Oliver..... .....London.
Greaves, William . .....Ironville.
Hart, Edgar Thomas .....Rochester.
Horry, William Thomas .....Boston.
James, Hugh.....Bodedern.
Jeeves, Henry .....Brighton.
Jones, John Morgan .....Brechfa.
Lee, Charles Henry .....Melton Mowbray.
MacBean, James Barnet.....Edinburgh.
Mart, Oliver George Russell ...London.
Middleton, David.....Aberdeen.
Miner, Major Thomas.....Walsall.
Thomas, Ivor Edward .....Merthyr.
Vallance, Arthur Clayton .....Mansfield.
Watson, Edwin Joseph .....Birmingham.
Watts, John William .....Finchley.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Restoration to the Register.

The names of the following persons, who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Thomas Williams, 1, Cleveland Villa, Northcote Road, Clapham Junction, London, S.W.
Alfred Yeatman, Chagford, Devon.

The Registrar reported that—
Richard Lewis, of Llansaintffraid, Montgomeryshire, having made a statutory declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported by a qualified person, his name had been placed on the Register.

Honorary Members.

The PRESIDENT said the next business on the agenda was the selection of names for nomination as Honorary Members to be elected next month, but inasmuch as the bye-laws were now under consideration, and it was proposed to make some alteration in the regulations for electing Honorary and Corresponding Members, he apprehended the Council would prefer leaving the question in abeyance for the present.

This view being acquiesced in, no names were mentioned.

Reports of Committees.

FINANCE.

The report of this Committee was read and confirmed, and sundry accounts were ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow, aged 58, of a member from 1841 to 1877. Applicant had a previous grant of £15 in October, 1881. Is in ill-health, and has a daughter in ill-health also. Hampshire.

£5 to the widow, aged 44, of a former member. Surrey.

£15 to the widow, aged 51, of a registered chemist and druggist. Surrey.

£10 to a registered chemist and druggist, aged 72, formerly in business for forty-five years; became paralysed in 1881. Yorkshire.

£10 as the usual quarterly allowance towards the support of the Isherwood orphans.

One other application had been deferred for further information, and four had not been entertained.

The report and recommendations of the Committee were adopted on the motion of the VICE-PRESIDENT, who stated that a very satisfactory report had been received with regard to the boy Isherwood, who had recently been apprenticed.

FREEHOLD INVESTMENTS.

This Committee presented a report, which was considered in committee.

After a long discussion the report and recommendation were unanimously adopted.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
February	Day	545	32	11	22
	Evening	174	20	2	8

Circulation of books.	No. of Entries. Town.	Country.	Total.
February	175	131	306

Carriage paid, £2 5*s*.

The undermentioned donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Journal of the Chemical Society, 1883.
Berichte der deutschen chemischen Gesellschaft, 1883. From Mr. WALTER HILLS.

Johanson (E.), Heizwerth eines Torfes.
— Ein Ei im Hühnerei.
— Zur Bestimmung des Alters der Biere, 1883.
— Zur Frage der Brennmaterialien.
— Zur Untersuchung von Zuckerwaren.
— Eine russische Steinkohle.
— St. Petersburger Hausseifen.
— Ein Desinfectionsmittel.
— Zur Gerbstoffbestimmung.
— Ein Patentmittel. From the AUTHOR.
Fourth Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts, 1883. From the BOARD.

The Committee recommended the purchase of the undermentioned works:—

Codex medicamentarius, Pharmacopée française, 1884. 2 *copies*.
Parrish (E.), Treatise on Pharmacy, 5th ed. 2 *copies*.
Proctor (B. S.), Lectures on Practical Pharmacy, 2nd ed. *A third copy*.
Remsen (I.), Principles of Theoretical Chemistry, 2nd ed.
Thudichum (J. L. W.), Pathology of the Urine, latest ed.
Ure (A.), Dictionary of Arts, Manufactures and Mines, 7th ed., vols. 1, 2, 3.
Watt (A.), Art of Soap Making.

Curator's Report.

The Curator had reported the attendances in the Museum during February to have been:—

	Total.	Highest.	Lowest.	Average.
Morning	585	42	15	28
Evening	98	20	1	3

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimens of crystallized Jambosin and of Di-mercuric chloride atropine hydrochlorate. From Mr. A. W. GERRARD.
Specimens of the resin of *Xanthorrhœa Greiossii*. From Mr. H. HART, West Australia.
Specimens of Red and of White Kola Nuts and of the fruits of *Myristica surinamensis*. From Messrs. T. CHRISTY AND Co.
Specimens of Kola Nuts wrapped in the leaves used for preserving them by the natives. From Messrs. SYMES AND HALLAWELL.
Specimen of Essential Oil of Limes from Trinidad. From Messrs. WRIGHT, LAYMAN AND UMNEY.
Specimen of pure Cymene, prepared frum Austraterebinthene by the action of Iodine upon it. From Miss E. C. HACON, Laboratory Student.
Fresh specimen of the root of *Urginea Scilla*. From Messrs. H. ROBERTS AND Co., Florence.
Specimen of a variety of Sarsaparilla collected in Paraguay. From Messrs. BURGOYNE, BURBIDGE, CYRIAX AND FARRIES.

An application for the loan of specimens from the Museum to illustrate a lecture on Tea had been received from Mr. Hasselby, of Doncaster.

The Professors had attended and reported satisfactorily of their respective classes.

A letter had been received from the India Office notifying the dispatch of a further collection of cinchona barks for the Society's Museum.

The PRESIDENT made an explanation in Committee as to inquiries he had been requested to make with regard to obtaining the paper required for the Journal on better terms. He then moved the adoption of the report.

Mr. WILLIAMS seconded the motion, which after some conversation was carried unanimously.

GENERAL PURPOSES.

The report of this Committee was taken as usual in committee. It included the reports from Professors

Bentley and Redwood as to the class examinations at the end of the first five months course.

Professor Bentley had reported that fourteen students had competed for the prizes, of whom a large proportion were worthy of distinction, and the general result was most satisfactory. He had never had a better conducted class, and the system of *vivâ voce* examination after each lecture had been found very useful. The number of students in attendance had been larger than last year.

Professor Redwood's report was also very satisfactory. He stated that the assistance he had received from Mr. Dunstan and Mr. Ince had contributed to make the instruction provided such as ought to be satisfactory to the students, and he believed it had been generally appreciated. Mr. Dunstan, in addition to his lectures on organic chemisty, had given six supplementary afternoon lectures. Mr. Ince had given thirty-eight demonstrations, preceded by short lectures, on practical pharmacy and dispensing.

The attendance at all these lectures and demonstrations had been regular, and the conduct of the students unexceptionable.

The Committee, having opened the motto envelopes to ascertain the names of the successful competitors, recommended that the following awards be made:—

Chemistry and Pharmacy.

Bronze Medal .....Fraser McDiarmid.
Certificate of Merit ...Ernest John Eastes.
" " Robert Wynne Chas. Pierce.
" " Frederick Edward Johnson.
" " George Frederic Callaway.

Botany and Materia Medica.

Bronze Medal .....Fraser McDiarmid.
Certificate of Merit ...Ernest John Eastes.
" " Equal. Frederick Edward Johnson.
" " Equal. Richard Henry Norman.
" " Equal. Josiah William Steward.
" " Robert Roberts.
" " Robert Wynne Chas. Pierce.
" " Equal. Ernest Haworth Earle.
" " Equal. Albert Wilson.

The report also included the usual letter from the Solicitor, reporting the progress of cases placed in his hands.

Several other cases of alleged infringement of the Pharmacy Acts had been considered by the Committee. In some cases proceedings were recommended to be taken, and in others further information was desired.

The PRESIDENT having given details of some of the cases referred to, a long discussion ensued with reference to one of the cases recommended for prosecution.

On resuming, the report and recommendations were unanimously adopted.

THE NORTH BRITISH BRANCH.

The PRESIDENT, referring to the resolution passed a short time ago authorizing the purchase of premises in Edinburgh suitable to the requirements of the Society, stated that an opportunity had been presented for purchasing a house in York Place, with a garden at back and stable in the rear. It was well situated and larger than was at present required, and an offer had been made for it. A condition was imposed by the vendors that no lettering or sign board should be affixed to the walls of the house for a period of ten years, and this condition he thought might well be acceded to.

Mr. GREENISH asked what amount would be required to make the house suitable for the purposes of the Society.

The PRESIDENT said he believed about £200 would cover it. He added that a communication had been received from the Council of the North British Branch recommending this purchase.

The Council went into committee to consider the details of the proposed purchase.

Mr. YOUNG said there would be some little expense in connection with moving and making various arrangements in fitting up the new building, but he did not think there would be much difference between what the Society was now paying and what it would eventually have to pay and he believed the step would give an immense impetus to the Society in Scotland. During the last forty years it had been growing, but none of the places in which it had been located was at all equal in importance to this one, or at all in keeping with what might be wished.

The PRESIDENT said he thought it might be taken that the new building would not cost more than £100 a year. Edinburgh was an academic city and it was very desirable that the Society should show medical men there that it was progressing.

Mr. HAMPSON said it appeared to him the purchase was very eligible, as it seemed to be just the kind of property the Council had been looking for. There was one consideration, however, and that was as to whether the Scottish Branch had ever paid. He did not think it had; but still he thought the members of the trade would in future show their loyalty to the Society, and give more encouragement to it. It was absolutely necessary that the Society should be well represented in Scotland, and the purchase was desirable on that account; but still he hoped Scotch chemists and druggists would consider it also to their interest to help forward their common objects by joining the Society.

Mr. BORLAND said that he was quite alive to the remark made by Mr. Hampson that many Scotch chemists and druggists had not supported the Society in the way they might have done; but it might be considered that in a place like Scotland, where there were only one or two chemists in a locality, there was great difficulty in bringing the men together. They had not the facilities which existed in the large towns of England to call meetings, and they probably did not meet each other once a year. He had several times expressed an opinion to his friends that by a little exertion on the part of those who took an interest in the Society, there would be no great difficulty in adding to the members, and he was quite sure it only required a little explanation of the benefits to be derived from the Society to add largely to its numbers. There was no antagonism whatever to the Society in Scotland, but there was this difficulty, that before anyone could be proposed as a member he must be known to a member of the Council, and he had had that difficulty put before him within the last few days.

Mr. YOUNG agreed with what Mr. Borland had said; he was happy, however, to tell Mr. Hampson that he had lately had the pleasure of auditing the accounts of the North British Branch, and was pleased to find that it was in the favourable position of being able to pay all its debts.

Mr. BOTTLE said there need be no difficulty in Scotchmen joining the Society. At the last meeting he nominated a Scotchman, because, although personally unknown to him, he was represented to him, by gentlemen on whom he could rely, as being a fit and proper person to be elected, and, therefore, he had no hesitation in signing the nomination paper. It would give him great pleasure to propose a great many more Scotchmen as members.

Mr. SCHACHT congratulated the President on the success of his endeavours.

The PRESIDENT said during his visit to Edinburgh, last week, he had endeavoured to impress on their Scotch friends that the desire of the Society was to make a strong pharmaceutical body for the whole kingdom, at the same time to make all allowances for geographical difficulties which might exist in the North. If the Society had not been so well located in Edinburgh in former years as it ought to have been it was to some extent the fault of the Scottish members, because whenever any suggestion had been made with regard to improving the accommodation, it had always been cheerfully adopted

by the Council of the Society. He felt sure the result of acquiring this building would be to bring in a large number of new Scottish members.

It was moved by the PRESIDENT and seconded by the VICE-PRESIDENT, and carried unanimously, that the house, No. 36, York Place, Edinburgh, be purchased on the terms and subject to the conditions mentioned by the President, and a committee appointed to consider and report what alterations should be made to fit the house for the Society's business.

THE MEDICAL ACTS AMENDMENT BILL.

The Secretary read the following correspondence with the Privy Council:—

Copy.

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square, London, W.C.,
"*March* 17, 1884.

"C. Lennox Peel, Esq., C.B.,
"Privy Council Office,
"Whitehall, S.W.

"*Medical Acts Amendment Bill.*

"Dear Sir,—On the 12th of April last, I ventured to call the attention of the Lord President to the provisions of the above Bill in so far as they relate to the preparation and revision of the British Pharmacopœia, and a memorial on the subject from the Council of this Society was subsequently addressed to the Privy Council.

"I now beg leave to inquire on behalf of the Council of the Pharmaceutical Society if it is the intention of the Lord President to include among the amendments, which I understand are to be moved in the Committee on the Bill in the House of Lords, one providing for the formation of a Pharmacopœia Committee including pharmaceutical chemists, as well as medical practioners.

"I am, dear sir, your obedient servant,
(Signed) "M. CARTEIGHE.
"*President.*"

Copy.

"Privy Council Office, Whitehall,
"19th *March*, 1884.

"Sir,—I have submitted to the Lord President of the Council your letter of the 17th inst. and I am to state, for the information of the Council of the Pharmaceutical Society that his Lordship regrets that he does not see his way to amend the Medical Acts Amendment Bill, in the manner suggested by you, by inserting a clause providing for the formation of a Pharmacopœia Committee including pharmaceutical chemists as well as medical practitioners.

"I am, sir, your obedient servant,
(Signed) "C. L. PEEL."

The PRESIDENT said the further amendments which had been introduced were simply with regard to the proportional representation of corporations as against universities on the Medical Council. He understood the Bill was to be read a third time in the House of Lords on Thursday.

Mr. HAMPSON then moved the following resolution, of which he had given notice:—

"That this Council observes that the Medical Acts Amendment Bill, now in the House of Lords, contains no provision by which the Pharmaceutical Society or British pharmacists shall be officially recognized and empowered to prepare and revise the future editions of the British Pharmacopœia, and recommends that the Law and Parliamentary Committee be authorized to take such steps as they may think fit to remedy this omission."

He said he was aware of the unsatisfactory reply which the President had received from the Privy Council, but there was one word in it which gave him a little encouragement, viz., the word "regret." If there were a sense of regret in the department that the opportunity was not quite suitable for the insertion of the amendment in the Bill to meet the views of the Society and pharmacists generally, he hoped that in the Commons there would be an opportunity of satisfying that regret upon the part of the Lord President. They must all feel regret that the efforts of the Society last year and the support which they received had not been recognized. He believed the case of pharmacists was perfect in so far as they had a claim on the Government at this time when it was about to legislate with respect to future Pharmacopœias, and he hoped they would be able—not to use sufficient pressure, for he did not like that word—but to show the House of Commons that they had a just claim on the Government, and were entitled to be legislated for in respect of the Pharmacopœia. They did not ask for any pecuniary benefit, they simply asked for this recognition in the interest of pharmacy itself. Their claim was in no respect antagonistic to the medical profession, and in moving this resolution he felt sure that if members of Parliament understood what was wanted they were sufficiently reasonable to meet them in a proper way.

Mr. SYMES, in seconding the motion, said it would not be necessary to occupy time by putting forward any argument in favour of the principle which the members of the Council had already recognized. They all felt the importance of this matter and had previously taken such steps as they thought were desirable to support the position they maintained. Unfortunately the Bill did not reach a sufficiently advanced stage in the House of Commons last session, or undoubtedly they would have accomplished what they desired. He feared the word "regret," which had been alluded to, was merely a figure or speech.

Mr. BOTTLE supported the motion.

Mr. WILLIAMS asked how far this resolution would give power to the Committee to proceed. Would it be authorized to issue petitions, etc., as was done last year?

The PRESIDENT said he certainly understood so.

The VICE-PRESIDENT said he presumed that, apart from any agitation, an endeavour would be made to get a clause inserted in the Bill when it reached the House of Commons.

Mr. HAMPSON said the object of the resolution was to place the matter in the hands of the Committee, which would of course make the best use of its time, so that when the Bill came to the House of Commons some member should move an amendment on the lines desired.

Mr. YOUNG thought everyone would accede to the proposition.

Mr. GREENISH also supported the motion, but said the matter had been so well thrashed out that it was not necessary to occupy time by repeating the old arguments over and over again. It was perhaps to be regretted that steps had not been taken earlier to remedy the matter in the House of Lords, but now the Bill was coming to the House of Commons, every possible step should be taken to get a suitable amendment inserted. If it were not done now another twenty years would elapse before a similar opportunity would occur, and he trusted every member of the Council would throw his whole heart into the matter, and that every effort would be made to carry out the principle of the resolution.

Mr. RICHARDSON also supported the motion.

Mr. BORLAND suggested that on the previous occasion the petition which had been prepared stated that it was on behalf of pharmacists and medical practitioners, and he thought it a very important point that medical men should be asked as far as possible to give their aid and countenance to the movement. Pharmacists did not aim at interfering with the introduction of any medicine into the Pharmacopœia. Those matters would be left entirely to the medical profession. It was only with reference to the practical part of pharmaceutical work that they aspired to have any voice in the question. He might repeat what he had formerly said, that the various members of Parliament with whom he had conversed on the subject gave their cordial support to the movement.

The PRESIDENT said no doubt Mr. Borland's remarks would be fully borne out, and that members of the medical profession would in large numbers support the proposition. With regard to what Mr. Greenish had said he might state that on his own responsibility, after consulting one or two other members, he had thought it better not to take any steps in the House of Lords, but to wait until the Bill had been introduced into the Commons before moving any further.

The motion was then put and carried unanimously.

THE CONVERSAZIONE.

The PRESIDENT said a letter had been received from the authorities of South Kensington, giving permission for the use of the Museum on May 21 for the annual Conversazione.

PATENT MEDICINES CONTAINING POISON.

The SECRETARY read a letter which had been received from the Halifax Chemists' Association, containing a resolution which had been passed on the subject of misadventures arising from the use of patent medicines containing poisons, and suggesting the urgency of new legislation, whereby the presence of such poisons should always be indicated by the makers thereof, and the sale of articles containing them restricted to those who alone were qualified by training and education to deal therein.

A communication on the same subject was also read from the Society's Local Secretary at Sheffield.

ERRATUM.—At page 724 the name of "Edward Peck, Ely," published in the list of "Apprentices or Students," should have appeared in the list of "Associates."

EVENING MEETING.

Wednesday, April 2, 1884.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The last Evening Meeting of the Session was held on Wednesday, April 2. The minutes of the preceeding meeting having been read and confirmed, a paper was read on—

AQUEOUS EXTRACTION OF CINCHONA BARK.

BY PROFESSOR REDWOOD.

The paper is printed on p. 797.

The PRESIDENT, in inviting a discussion, suggested that it should be confined exclusively to the subject of liquid extract of cinchona. He would only say, in passing, that the Professor had very ingeniously dropped his old friend and taken to the new one. He should be glad if he had thrown his first love over with something like courage. Possibly there were some gentlemen present who might have something to say for the so-called liquid extract of cinchona which now existed in the Pharmacopœia. With all due respect to the Professor, he must say that he had weakened the force of his argument by the first two paragraphs of his paper, for, in one place he referred to the value of the existing preparation, and then he stated in so many words that practically it was not very valuable.

Mr. GILES requested that before the discussion commenced Professor Redwood would state what he meant by quinovin.

Professor REDWOOD said that he found that the term was very generally used to represent a bitter amorphous extractive matter which was capable of being taken out from cinchona barks, and which after concentration was precipitated by dilution.

Dr. PAUL said that he had listened to the paper with very great surprise, on account of the remarkable discrepancy between the statements contained in it and the position which Professor Redwood took up with regard to the liquid extract of cinchona on a previous occasion. About a year ago he (Dr. Paul) brought before the meeting some data which led him to conclude that the liquid extract of cinchona was not altogether what it was commonly believed to be, or what he believed such a preparation ought to be in regard to the drug from which it was prepared. One objection which he raised against the liquid extract of the Pharmacopœia was its invariable deficiency in the amount of alkaloids which it ought to contain, and that therefore the recommendations which were given of it were misleading to medical men. On that occasion Professor Redwood defended the preparation and the method of preparing it, and he characterized the objection that it did not contain the medicinal constituents of the bark as a very weak objection. The present paper, however, appeared to be a perfect recantation of the position which Professor Redwood previously took up. He now said that there was a strong ground of objection to the official mode of preparing liquor cinchonæ. That was precisely what he (Dr. Paul) had said a year ago. Indeed, Professor Redwood's present statement appeared to be a confession which admitted all the charges which he (Dr. Paul) made against the preparation and the process by which it was prepared. The Professor might, however, have been somewhat more candid in his confession than he had been. In consequence of the vigorous defence which Professor Redwood made on the last occasion, he (Dr. Paul) was discouraged from following out the matter and had remained passive ever since. His objections to the official process were not received with favour, and there did not seem any prospect of a proposed substitute being better received; therefore when Professor Redwood spoke of the difficulty which he had had to get his friends to undertake the investigation of the subject it must be remembered that the difficulty was somewhat of his own creating. In commenting upon the chief objection to the liquor cinchonæ, that it did not contain all the medicinal constituents of bark, Professor Redwood instanced the infusion of camomile and asked who in his senses would think of objecting to that infusion because it did not fully represent all that was active in the camomile flower. It was remarkable that, after such a brief lapse of time, he should now come forward and abandon his former position and recommend the present preparation, because it fully represented the medicinal efficacy of the bark. It could not be supposed that in this short space of time the Professor had taken leave of his senses, and yet he now came with a recommendation which only a year ago he characterized as senseless. Then as to the material from which the new preparation was to be made, they were told that it was red bark. But what red bark? Certainly not the red bark of South America, which, however valuable it might be for making tooth powder, had very little febrifuge value, and would not serve for making the liquid extract. He apprehended that the bark used was the Indian red bark, which a year ago he was told was so utterly outside the pale of official pharmaceutical recognition that he was making an unwarrantable assumption in presuming to bring forward experiments made with that bark to show that the process in the Pharmacopœia was useless. His experience of the red bark of India, notwithstanding the favour with which it was regarded by some persons, was that it was about the worst bark which could possibly be used. It contained much objectionable material, which resembled extract of kino more than anything else, and he should judge that it was about the most unsuitable of any for pharmaceutical purposes. There was plenty of cinchona bark of the true calisaya or officinalis type, which he regarded as preferable, and which possessed the advantage of having very little of the red offensive looking and nauseous material which was precipitated by water; such bark contained a large percentage of alkaloid in which quinine preponderated. They were told at the last discussion that the reason that he obtained unfavourable results was that he used the Indian bark, which was a material not ordered in the Pharmacopœia. He (Dr. Paul) took it that in the lapse of time Professor Redwood had recognized the

validity of the objections which he (Dr. Paul) raised on the former occasion, and that he had now sought to devise a process by which those objections could be avoided. As to the process itself, it consisted in treating Indian *Succirubra* bark, he supposed, not with water, but with dilute acid. He could not accept the representation that this was an aqueous treatment, seeing hydrochloric acid was employed. He should like to see some data which would enable them to judge how far the preparation, made with hydrochloric acid, really did represent the bark in every respect. That he believed to be the chief point about the whole of the preparations of bark. A great deal had been said about the relative efficacy of different preparations and medical opinions with regard to the water preparations had been alluded to. No doubt those opinions were deserving of respect, although they were not altogether intelligible in the present state of our knowledge. It appeared that the very strong predilection amongst medical men in favour of the decoction was due, not to the constituents which it contained, but to the manner in which the constituents were presented to the stomach. In all kinds of cinchona bark, he believed, the principal part of the alkaloids was in combination with cinchotannic acid, and in that form of combination the alkaloids were very sparingly soluble in water. The consequence was that the infusion which was made with cold water was the weakest of any; the decoction was stronger, but though the solubility of the cinchotannates was greater in hot water than in cold, a large quantity of cinchotannate was deposited when the water cooled. What remained was in the same state of combination as in the bark itself, and that, he believed, was one of the reasons why the decoction was preferred to any other preparation. With regard to the liquid extract, he thought that the same condition ought to be maintained, and that an attempt should be made to avoid the elimination of the cinchotannic acid, and its decomposition, which took place very readily alkaloids in the state in which they existed in the bark. when it was liberated, so as to obtain a solution of the Professor Redwood had spoken of certain "worthless" constituents being eliminated. He (Dr. Paul) failed to see on what authority Professor Redwood condemned those constituents, or why he assumed that the alkaloids contained in his finished preparation were in the state in which it was desirable they should exist. This must be left for further inquiry. His (Dr. Paul's) own opinion was that the use of hydrochloric acid in preparing liquid extract was decidedly objectionable. Professor Redwood had stated that there was nothing in the preparation made by the process which he had now described which was not freely soluble in water. Consequently there was no cinchotannate of the alkaloid, and it might be inferred that this had been decomposed. This was in fact shown by the absence of turbidity on diluting the new preparation with water. The cinchotannate was, however, precisely the constituent which it was desirable to retain in a liquid extract. As to the exhaustion of the bark, there were no data showing that the new process was efficient. He was inclined to doubt whether treatment with weak acid would extract the whole of the alkaloids. The objections which he urged to the process were chiefly made on chemical grounds. He would leave the pharmaceutical part of the discussion to others who were more competent to deal with it.

Mr. GILES said that he thought that it was perfectly immaterial whether Professor Redwood had changed his opinion or not, but he should like to say a word for the much abused old liquid extract. Some time ago having occasion to examine liquid extract of cinchona he obtained specimens of all the preparations known to the market and amongst them, two samples of the Pharmacopœia liquid extract, one from a highly respected retail house, and the other from a manufacturing firm. The former contained 1·498 per cent. and the latter 1·860 per cent. of basic alkaloid. Pharmacopœia Calisaya bark ought to contain 2 per cent. of basic alkaloid; and if those extracts which he examined were made from Pharmacopœia Calisaya they showed a very good result, for they contained nearly all the alkaloids that ought to have been present in the bark. He also examined some extracts which were very much advertised as being superior preparations. One of these contained 1·495 per cent. of the alkaloids, and this was by far the highest percentage among those much advertised preparations. Battley's preparation gave a higher percentage, but for certain reasons he did not include it in the category. Hence, having regard to the lights which existed fourteen years ago, when the Pharmacopœia was compiled, the old Pharmacopœia preparation was not so disreputable. His experience was that medical men had very great faith in the old liquid extract when it was properly prepared. He believed that the reason was that the bark contained constituents of very great value, which were not alkaloids. What was wanted was a preparation of bark. If simply the active principles were required the alkaloids themselves could be used. He was very suspicious when he heard his friend, Professor Redwood, proposing to turn out what he called "quinovin." It was a dangerous thing to begin turning out anything, and he did not see the necessity for it. With regard to the mode of preparation, he was very suspicious about the direction to macerate at a temperature of 180° F. His experience was that no good was to be got from a high temperature. Another part of the process given in the paper consisted in adding distilled water to the concentrated percolate and stirring together while a precipitate was forming. But he did not see why there should be any precipitate formed at all. He had evaporated large quantities down to a solid extract, which he found perfectly soluble. It was true that he did not use a temperature of 180° and that the evaporation was performed *in vacuo*. He questioned whether the process of precipitating by soda in the manner directed for estimating the percentage of alkaloid in the solid extract would be found to be reliable. He thought the precipitate so obtained would be likely to consist largely of cinchotannate and would give too high a result; but that was a detail which might be amended. His impression was that they knew very little about bark, and that it was a rash thing to say what part of it had a medicinal value and what part of it had not. He held that all the surroundings of the alkaloids were important, and that the real object in making an extract was to get out all that was soluble and could be retained in the soluble condition. It was an easy thing for the Professor to cut the Gordian knot, by precipitating some of the material and filtering it out if he could not keep it in solution, and thus to obtain a soluble residuum. A soluble preparation might always be obtained in that way, but he did not think that that was a fair way of overcoming the difficulty. The Professor said, "The small quantity of hydrochloric acid used in the process is sufficient to ensure the entire removal of the alkaloids from barks of average and even more than average quality." He doubted that statement entirely. He did not know whether Professor Redwood had examined the marcs afterwards; but he (Mr. Giles) had often found 1 per cent. of alkaloids left in a bark containing originally 7 or 8 per cent., although hydrochloric acid was used and the percolation was conducted precisely as directed in the present paper.

Professor REDWOOD said that he was prepared to show that there were no alkaloids left in the liquid.

Mr. GILES said that the recognition of the use of hydrochloric acid was an important advance in the process. Unless an acid was used there would be a waste of alkaloid. With all due respect to Dr. Paul, he believed that the hydrochloric acid dissolved the cinchotannates of the alkaloids as cinchotannates. He knew that, having dis-

solved them out, they could be got back again as cinchotannates, though that did not show that they had not undergone a change in the meantime.

Mr. HOLMES said that he had tasted the extract on the table, and he found that the astringency had not been destroyed by the hydrochloric acid. He believed that hydrochloric acid was always present in the gastric juice, and therefore if the preparation was not submitted to the action of hydrochloric acid before it entered the stomach, it certainly was afterwards.

Mr. DUNSTAN said that he should think it extremely probable that the hydrochloric acid decomposed the cinchotannates, forming cinchotannic acid and chlorides of the alkaloids. He supposed that when Mr. Giles said that he could get back the cinchotannates, he meant by the addition of ammonia.

Mr. GILES said that he got them back by treating with acetate of soda.

Mr. DUNSTAN, resuming, said that that amounted to the same thing. Assuming that they could not get the cinchotannates out by water alone, the next best thing was to get out the cinchotannic acid and the alkaloid separately. That seemed to be what Professor Redwood did. He was struck with one point in connection with what Professor Redwood supposed to be the necessity of making a solid extract of cinchona. It seemed to him that a standard liquid extract could more easily be got by estimating the alkaloid in the strong solution, and then diluting it to the requisite extent. He supposed that it was a troublesome operation to evaporate the solution to dryness. On the other hand, if it was thought desirable to have a soluble solid extract in medicine it seemed unnecessary, if this were standardized, to have a separate liquid extract. During the reading of the paper he recollected very forcibly a remark made by Professor Huxley, which was that a scientific man should be strangled when he arrived at the age of fifty, for he then became an obstacle to progress. Professor Redwood, however, was a proof to the contrary, for he was now taking a decided step in the direction of progress in advocating a standard liquid extract which contained a specific amount of alkaloid.

Professor BENTLEY said that he imagined that the great advantage of using succirubra bark was, first, that it contained a good amount of alkaloids; secondly, that it was not very liable to vary; and thirdly, that a regular supply could be obtained. And in addition to these advantages it was a bark which could be readily recognized, and it could be generally procured free from any serious adulteration. Those were very important considerations in the selection of a bark for general use. succirubra had high authority for its use, for Dr. Flückiger recommended it some years ago, although he said that in certain respects it was not equal to some other barks. It was the sole bark recognized in the German Pharmacopœia, and it had been introduced into the Pharmacopœia of the United States. It was also one of the barks mentioned in the new Paris Codex. Mr. Holmes had also ably advocated the use of the red bark, and therefore it did not come before the meeting as something which was unknown. He did not altogether agree with his colleague with regard to the turning out of certain substances. Bark contained many constituents, and it was not known how one substance might modify the action of another. He was speaking exclusively of Succirubra bark, which was obtained from plants cultivated in India and elsewhere.

Mr. WALTER HILLS, referring to the statement in the paper that the author had had some difficulty in persuading his pharmaceutical friends to publish their modes of preparation, said that, after that discussion, and after the change which had been made, they might hope that those who had worked at the subject would make known some of the results of their work.

Mr. TANNER said that he was very pleased to find Professor Redwood advocating a liquid extract representing a less amount of bark than the Pharmacopœia did. In the Pharmacopœia preparations, four ounces of bark were used, and that on all hands was shown to be an unnecessary concentration. With regard to Mr. Giles's remarks about the assay of certain samples of liquid extract, he wished to ask Mr. Giles whether he took into account the fact that the Pharmacopœia used four ounces.

Mr. GILES said that he had not done so. He had overlooked that circumstance when making the comparison, which should have been confined to the relative alkaloidal strength of the pharmacopœial and other liquid extracts.

Mr. HADFIELD said that the method by which Professor Redwood had got at the percentages of the alkaloids contained in the liquid extract seemed to him to be rather crude. He thought that a better result would be obtained from the solid extract of which Professor Redwood had spoken, and that the alkaloids of the solid extract would be better represented by previously obtaining an analysis of the bark. Of course this method would involve more trouble.

Dr. PAUL said that in a case of perfect exhaustion the quantity of quinine which ought to be contained in a fluid extract made from a two per cent. bark,—the minimum laid down in the Pharmacopœia—would be 35 grains in the fluid ounce. In the case of ten samples which he examined a year ago, however, the total alkaloids only ranged from 2 to 10 grains in the fluid ounce, and then the greater part was alkaloid other than quinine.

Professor REDWOOD, in reply, said that his object in taking up the subject before the meeting was to elicit from other people the best means of producing a preparation of bark which had been much extolled by medical men, and most severely criticized and condemned by pharmaceutical speakers in that room. He certainly felt that it would be more becoming on the part of those who had so strongly criticized the liquid extract of bark if they had indicated in what way a preparation having a similar object could be more satisfactorily produced. He had failed to induce anybody to take the matter up. He had been pleased to find that, in the present discussion, the criticisms had been rather criticisms of his conduct than criticisms of his paper. He had desired to ascertain the opinion of competent pharmacists as to the process which he had suggested, but he was told that he stood in a false position. He gathered that he had been looked upon as the author of the Pharmacopœia preparation, and he had been asked how he could come and condemn it. The origin of that preparation was well known, and he was not aware that it was at all inconsistent to hold by it until a better was known. That was precisely what he had endeavoured to do on the former occasion. He certainly at that time took exception to Dr. Paul's paper, because there were too many assumptions in it, and it criticized a preparation that was not the Pharmacopœia preparation at all. Years ago, when he occupied the position which was now held by Dr. Paul, nearly all the barks which came into the London market were regularly analysed by him and reported upon, and therefore he could not fail to be perfectly familiar with the chemistry of the cinchona barks. But all that he had contended for was that in the absence of any better preparation they were justified in holding to that of the Pharmacopœia. Mr. Giles had very fairly commented upon the process described in the paper, but he (Professor Redwood) did not think that Mr. Giles had in any respect damaged his position or shaken his conclusions. Mr. Giles had not shown a better way by which the valuable constituents of cinchona bark could be taken out; and he (Professor Redwood) gathered from Mr. Giles's statement that his method was the right one. Mr. Giles's strongest objection was that the process described excluded from the finished preparation something which he thought ought to be retained. Upon that point he (Professor Redwood) was at issue with him. He did not think it desirable to leave

all the extractive matter in the finished preparation. What he did consider desirable was to have a preparation which would dilute with water and form a clear liquid, possessing the astringency and the aromatic flavour of good bark. He had obtained this, and he had turned out the red cinchonic and what he had termed quinovin, a body which Mr. Howard designated as a nauseous bitter which was highly objectionable in the administration of the bark. The liquid extract of the Pharmacopœia and other extracts which professed to resemble it, and even that which was ordered in the United States Pharmacopœia, all possessed the grave defect of throwing down a copious precipitate of a nauseous disagreeable bitter when they were diluted, and this was a substance which he conceived to interfere with the efficacy of the medicine. Mr. Dunstan had made a very proper suggestion with reference to the preparation of a dry extract as well as the liquid extract. He (Professor Redwood) had admitted in the paper that perhaps most producers of the liquid extract would not take the trouble of getting the dry extract first. It had been suggested to him that the dry extract would be found to be highly hygroscopic, and very difficult of preservation. He had endeavoured to satisfy himself on that point, and he had left some of the solid extract exposed in a dish in his room for a week. The test to which it had been subjected was an exceedingly severe one. He admitted that it attracted moisture and softened, but its hygroscopic character was not greater than would be expected in a dry extract of that description. He looked upon this preparation as one which would one day admit of use in medicine. An infusion or decoction would be better made from such a dry extract than by the ordinary mode, but there was a little difficulty in making a standardized dry extract of definite strength. Experiments would have to be made on that point, but he had been anxious to bring forward his present preparation before the meetings of the session terminated, in order that it might be criticized and tested by good pharmacists. He had put himself in communication with such men as merchants who were dealing with these barks, and the opinion which they had uniformly expressed was that succirubra bark would be the bark of the future, as far as application in pharmacy was concerned. It was not the object of his paper to indicate what ought to be the characters of the succirubra bark which was selected for use. That was a perfectly distinct question, in which he should look to his colleague (Professor Bentley) to take a leading part. Mr. Howard had told him that there was an abundance of succirubra bark which contained more than 10 per cent. of the mixed alkaloids. In his paper he had put out of account the low class barks; but, taking the Indian succirubra bark, he maintained that the process which he had given was a process which was applicable to any such bark, and that by means of it they could get a valuable and suitable preparation for use in medicine. He had not yet been able to get samples of all the various qualities of succirubra bark. He was desirous of taking a low class, a medium, and a high class, and ascertaining whether there was any fixed relationship between the alkaloidal strength and the amount of extractive matter, or what he might call the extractive strength, of the different qualities. He wished to ascertain whether the cinchotannic acid, and the fine aroma and flavour which he regarded as one of the most valuable medicinal constituents of the bark, bore any fixed relationship to the alkaloids which were present, in the same way that, according to Mr. Dunstan's showing, the extractive matter of nux vomica bore a uniform relationship to the alkaloids contained in the drug. This was one of the points which would have to be determined before an extract of this description could be standardized. Mr. Giles had thrown out a doubt whether the small quantity of hydrochloric acid which was used was sufficient to exhaust the bark. He could vouch for the fact that the liquid which came off at the end of the percolation gave not a trace of precipitate of any kind upon the addition of an excess of caustic soda, but remained perfectly clear. He therefore contended that the whole of the alkaloids were taken out. He might further state that after having exhausted the bark and evaporated the percolate down to a low extent he got a precipitate upon adding water. Mr. Giles had said that he need not get a precipitate. He should like Mr. Giles to explain how it could be avoided. Some barks gave a precipitate like thick mud, while other qualities gave very little; but, whatever bark was used, he held that dilution with water and the throwing down of such precipitate as might be formed were desirable, and that this method gave a result which was in every way superior to that which was obtained when the precipitate was left in the preparation.

The PRESIDENT said that the Professor had been wonderfully strong in reply, as he always was. It was almost a greater treat to hear him reply to than to hear him read a paper, for the reply contained a fire which the paper often lacked. He must confess that his reply was strong, except in one respect. When he told them, with the dignity of a professor, that because he found no alkaloid in the percolate, the bark was exhausted, he must forgive him (the President) for saying that the statement was extremely weak. An analysis of the bark ought to be made before they could accept the statement. Perhaps the Professor would modify his statement upon that point. He must congratulate the Professor upon the active way in which he was able to deal both with friends and with antagonists. He concluded by conveying the cordial thanks of the meeting to the Professor.

The following paper was read:—

THE APPROXIMATE ANALYSIS OF THE SEEDS OF AMOMUM MELEGUETA.

BY JOHN C. THRESH, D.SC.

The paper is printed on p. 798.

Mr. HOLMES then called attention to the recent additions to the Museum. He said that several of the chemical products had been presented by students who were in the Laboratory. Among these specimens were some fine crystals of phosphoric acid presented by Mr. Huskisson. The majority of the specimens on the table were a small proportion of a large collection of the materia medica of Brazil, which had been presented by Dr. Domingo Parodi, through Mr. W. B. Cranwell. This collection comprised nearly all the medicinal products of Brazil and the neighbouring countries. There was also a collection of medical plants recently presented by Mr. Thomas Hanbury, which had been overlooked when the herbarium of the late Daniel Hanbury was given to the Society a year or two ago.

The PRESIDENT said that the Council would in due course pass a vote of thanks to those donors, who were helping to make the Museum of the Society probably the finest in the world.

The meeting was adjourned until the first Wednesday in October.

Provincial Transactions.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The eleventh meeting of the session was held in the Pharmaceutical Society's Rooms, 119A, George Street, on Wednesday evening, March 26, at 9.15. Mr. C. F. Henry in the chair. There was a large attendance.

The minutes of the former meeting having been read and confirmed, the President, in intimating with regret that the Secretary had tendered his resignation, expressed the great ability with which Mr. Crowden had filled his office.

Mr. MacEwan gave in the Prize Committee's report on the Ainslie Pharmacy Prize Competition, which showed that all the candidates had arrived at a high state of excellence. The winner of the prize was Mr. Thomas Miller, while an extra prize offered by Mr. W. Aitken was carried off by Mr. A. R. Bennet. Mr. Ainslie, who presented the prizes, addressed words of encouragement and advice to the candidates.

On the call of the Chairman, Mr. W. S. Turnbull read a paper on "Elementary Botany," in which the essayist, after inculcating the necessity of practical work, proceeded to describe the structure and development of cells, vessels, roots, stems and leaves, using a series of well-executed diagrams with good effect, and concluded by drawing attention to the microscopic specimens on the table.

The President, remarking on the concise and lucid paper, was sure that it would serve its object as a help to those preparing for examination. He moved a hearty vote of thanks to Mr. Turnbull. Mr. Aitken seconded, and the motion was unanimously carried.

A discussion followed, taken part in by Messrs. Boa, Hill, MacEwan, Pirie, Robertson and Stephenson.

Afterwards queries were submitted and replied to.

Some further business having been disposed of, the meeting adjourned.

Proceedings of Scientific Societies.

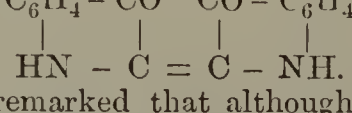
CHEMICAL SOCIETY.

The Anniversary Meeting was held on Monday, March 31.

The President, Dr. W. H. Perkin, F.R.S., read his Annual Report. The number of Fellows at the last Anniversary was 1247; the present number is 1324, or an increase during the year of 77. The loss sustained by death has been exceptionally great, the following having died during the past twelve months:—Messrs. R. R. F. Davey, W. Grant, W. Griffin, J. Hogarth, G. M. Hopwood, E. Hunt, C. H. Hutchinson, W. A. Peake, T. Pearsall, W. Plunkett, G. B. Robertson, F. Slinger, J. Hill Smith, W. Spottiswoode, J. T. Way, J. Young, and Sir C. W. Siemens. The rooms of the Society have been redecorated. Many additions have been made to the library, and it is hoped that the new catalogue will be completed by the end of the session. The collection of autotype portraits of past Presidents is almost complete, and is on view in the Council room.

The President then handed the Longstaff medal to Mr. O'Sullivan, as the Fellow who, in the opinion of the Council, had done most to promote chemical science by research during the last three years. Sixty-seven papers have been read before the Society since the last anniversary.

The President then proceeded to refer briefly to some of the most important advances in chemical science during the year. The numerous determinations and recalculations of atomic weights by Clarke, Lothar Meyer, Brauner, Thorpe, Dewar and Scott, etc.; the use of boiling oxygen and ethylene as refrigerating media; the freezing of alcohol at $-130°$; the use of hydroxylamine as a reagent in organic chemistry by Victor Meyer and his pupils; the improvements in the preparation of this substance by Divers, etc.; the numerous researches of Baeyer on the constitution of indigo, which may be represented—



The President remarked that although there are now several processes by which this colouring matter can be manufactured, it cannot as yet be produced at a sufficiently low price to compete with the natural product. The work of Lewkowitsch on mandelic acid, of Hofmann on pentamethyl anilin, and of Victor Meyer on thiophene, etc, were also briefly described.

The address concluded with some considerations as to the influence the increasing number of laboratories and the greater facilities for the study of chemistry have had on the development of chemical science in this country.

The first thing that attracts attention is the startling and anomalous fact that the number of papers read before the Society is declining year by year; in 1880–1 it was 113; in 1881–2, 87; in 1882–3, 70; and last year it was 67. The work of our laboratories at the universities, colleges and hospitals seems to consist mainly in studying the ordinary course of qualitative and quantitative analysis and in attending one or two courses of lectures. Such an education is insufficient, it is only a preliminary part of the training. The subsequent prosecution of scientific research under proper supervision calls out all the faculties of the student, requiring independent thought, and gives an insight and vivid interest in the science which nothing else can do. In Germany the degree of Doctor of Philosophy has undoubtedly done much, as it necessitates the prosecution of original work, and now that degrees are so highly thought of in this country (though why a chemist with one of our ordinary degrees should be preferred to one who has fully given his mind to his science, and, therefore has not such a degree, it is difficult to understand); it is believed that if something analogous to the Ph.D. degree could be inaugurated in this country it would help the further advance of chemical science in this country. It is said that students cannot be induced to stay longer than is necessary to go through the ordinary course of analysis, and can this be wondered at when they do not see anything else going on of sufficient interest to make them feel that it would be a great advantage for them to stay? Would it be the case if higher work were being enthusiastically carried on? The fact that many of our students leave this country for Germany, where research is carried on with so much zeal, is a sufficient answer to this question. In conclusion, the President expressed a hope that at the Central Institute of the City and Guilds of London chemists would be trained in such a way as not only to carry out existing processes, but also to advance the chemical industries of the country by suggesting improvements and new processes, so that these industries might flourish and at least keep abreast of those on the continent.

Dr. Gladstone said that it was his agreeable task to propose a vote of thanks to the President, and at the same time to move that his address, which had been so enthusiastically received, be printed.

The vote was seconded by Mr. Howard, and carried unanimously.

The Treasurer then read his report. The total income of the Society was £4732 16*s.* 4*d.* The expenses, including the purchase of £300 stock, amounted to £3028 1*s.* 9*d.*, leaving a balance in the bank of £1704 14*s.* 7*d.* The balance was larger than had been anticipated, because an unusual number of Fellows elected during the year had paid life compositions, and because the new catalogue had not yet been completed. The principal items in the expenditure are:—Journal, £1591; library, £241; redecoration of rooms, £294; house expenses, £185; commission, £145. The assets of the Society amount to £9792 14*s.* 7*d.* As to the research fund, receipts amounted to £431; grants, £95; balance, £336. Assets, £4836 3*s.* 3*d.*

Votes of thanks were proposed to the Treasurer, the Auditors, the Officers and Council, and the Editor, Sub-Editor, and Abstractors.

After a ballot, the Scrutineers, Messrs. Greenaway and Williams declared the following officers and Council duly elected:—President, W. H. Perkin, Ph.D., F.R.S.; Vice-Presidents, Sir F. A. Abel, Warren De La Rue, E. Frankland, J. H. Gilbert, J. H. Gladstone, A. W. Hofmann, W. Odling, Sir Lyon Playfair, H. E. Roscoe,

A. W. Williamson, P. Griess, G. D. Liveing, E. Schunck, T. E. Thorpe, A. Voelcker, W. Weldon; Secretaries, H. E. Armstrong, J. Millar Thomson; Foreign Secretary, H. Müller; Treasurer, W. J. Russell; Members of Council, E. Atkinson, H. T. Brown, T. Carnelly, M. Carteighe, R. J. Friswell, W. R. E. Hodgkinson, D. Howard, F. R. Japp, R. Meldola, R. Messel, C. O'Sullivan, C. Schorlemmer.

SOCIETY OF ARTS.

Alloys Used for Coinage.

The third of the series of Cantor lectures by Professor W. Chandler Roberts was delivered on Monday the 31st ult., and treated almost exclusively of the methods by which the accuracy of weight and fineness of the alloys were ensured. A method used extensively in the middle ages, and up till quite recently in the Royal Mint, consisted of drawing the alloy across a piece of fine basaltic rock, termed a touchstone; the streak produced was compared with streaks of alloys of known composition, and thus the approximate composition of the alloy obtained. Another method more largely used than supposed is that suggested by Archimedes, its application being based on observations on the different densities of alloys. The principal electrical test lies in the amount of electromotive power generated by the alloy when placed in a corrosive fluid as compared with the amount generated by an alloy of known composition subjected to the same action, the electromotive power in each case being gauged by a galvanometer. Professor Hughes's induction balance is also sometimes employed to test the inductive properties of the alloy. Almost the only optical instrument used for the assay of alloys is the spectroscope, but the results of experiments obtained by this method have been found more delicate than utilizable. The lecturer then gave a detailed description of the chemical method of assay used at the present time in the Royal Mint, illustrating this part of his lecture with experiments. He mentioned the fact that when English standard silver is heated in air a light grey coating is formed, when the French standard silver is experimented upon a darker grey is obtained, and if a base alloy be taken the coat becomes black. This is due to the oxidation of the baser metals in the alloy. Advantage is taken of this difference in behaviour of the metals in the operation known as "cupellation." The alloy is strongly heated in a porous crucible termed a cupella; the litharge formed flows into the pores of the cupella, carrying with it all the baser metals in the alloy, and the globule of metal remaining at the bottom of the cupella consists of a mixture of gold and silver. This button of metal is hammered and then rolled into an elongated form, and afterwards boiled with nitric acid until all the silver is dissolved. The remaining gold is now in such a fragile form that the slightest touch will reduce it to powder; it is therefore hardened by slightly heating it in the furnace in order to enable it to be handled. The amount of silver dissolved by the nitric acid is determined by titration with a standard solution of common salt. The silver may exist in the alloy in such a small quantity that the nitric acid will not act upon it; in this case about three times the amount of silver is added to it, when the nitric acid not only readily acts upon the added silver, but also upon the silver previously existing in the alloy. Though the results of these experiments would be theoretically correct, it is found that a small quantity of gold and silver, especially the latter, is unaccounted for. The silver may be lost by flowing away with the litharge into the cupella, and also by a slight volatilization. In dissolving the silver with nitric acid it is also found practically impossible to separate the whole of the silver from the gold. Gold may also be lost in the process of cupellation, but the slight admixture of silver with it after having been boiled with nitric acid causes the alloy to apparently have a larger percentage of gold than is really the case. To avoid these slight errors, pieces of alloy of known composition, termed "checks," are submitted to both operations side by side with the alloy to be assayed, and from comparison with the known errors in the composition of these "checks" the composition of the alloy is calculated. The amount of fluctuation allowed between the composition of the alloys, known under the name of "remedies," has been gradually reduced since 1279, the "remedy" of gold in an alloy being now 0·2 per cent., whilst silver is allowed 0·4 per cent. Professor Roberts remarked that it was worthy of note that the Arabian alchemist, Geber, not only gives an accurate description of the process of cupellation as employed by himself, but also describes of what materials and in what manner the cupella itself is made, which method remains at present unaltered. The method proposed by Gay-Lussac for the assay of alloys is thought practically useless, and is only used as a means of verification.

Parliamentary and Law Proceedings.

Suicide by Prussic Acid.

An inquest was opened at Southampton on Friday, March 28, before the Borough Coroner, Mr. William Coxwell, concerning the death of Henry William Collis, aged 19 years, supposed to have committed suicide by taking prussic acid.

Mr. H. W. Collis, sen., deceased's father, said he was told his son was in a fit and went to him, finding him about fifty yards from his house. He appeared to witness to be very much intoxicated, and with assistance he was brought home. Still believing him to be intoxicated, from the very strong smell of beer about him, he laid him on the hearthrug, and put a pillow under his head. He was with him about ten minutes, and then left him alone. After about twenty-five minutes he found his son very warm, the perspiration standing on his forehead; heavy breathing had ceased, and he was breathing very little. Witness being uneasy about him felt his pulse, and finding it was not strong enough for a strong man, he felt in the region of his heart, but could feel no pulsation there. Witness took up his coat to lay over him to keep him warm, when a bottle fell out of it, or he saw it, marked "Poison"—that produced was the same. Directly he caught sight of this he ran to Dr. Archer's, but he not being at home he hurried to the shop of Mr. Gibson, the chemist, whose label was on the bottle, and from what he told him he went to Dr. Palk, who came directly, and pronounced him dead. Questioned as to the state of his son's mind, Mr. Collis said he never knew a more cheerful lad, and he was not aware that his mind was affected in any way.

James Edward Gibson, chemist, of 34, Above Bar, stated that on Thursday morning, between nine and ten o'clock, deceased came to his shop and wished witness to go to his father's to poison a dog for him; but witness told him that being single-handed he could not leave his shop. Deceased said he was very sorry, for the dog had met with an accident the previous night. Deceased then asked if witness would let him have the poison to take up to his father, saying that he was in a hurry to get away by an early train and the dog was suffering, and he wished to get rid of the animal before he went away, and knowing him, and his father also, witness let him have the poison, subject to the precautions prescribed by the Act, viz., labelling the bottle "Poison" and getting deceased to sign for it on the record, giving the date, quantity, and purpose for which it was required. The Act further required that if the purchaser was not known there was to be a witness introducing him, but knowing the deceased personally this was not required here. He served him with two drachms of prussic acid, deceased suggesting a larger bottle as more convenient to administer to the dog. Witness produced his book containing the signature of the deceased, whom he had

known two or three months, but his father a longer period. Deceased was quite rational and collected. He knew the deceased not perhaps personally, but as the son of Mr. Collis, and he had spoken to him. He considered his knowledge of deceased sufficient to fully warrant him under the Act in serving him with the acid.

By Mr. Killby, solicitor, who had watched the case in the interest of the witness: He believed deceased's story as to the purpose to which he intended to apply the poison, for it was a most plausible one, and witness considered he had faithfully carried out the requirements of the Act.

Dr. Henry Palk stated that he was called to see the deceased at his father's residence in Portland Terrace, and found him in the front room, on the hearthrug, quite recently dead. He made a superficial examination and found the face and neck very livid, the hands and nails likewise, the pupils dilated, and the muscles very flaccid. Mr. Collis handed him the bottle produced, which, though empty, still smelt strongly of prussic acid, and all the symptoms were concurrent with deceased having died from this poison, though without a *post-mortem* examination he could not say positively that this was the case. If deceased took all the prussic acid that was sold to him his death would have ensued in a few minutes, and he could not understand, if such was the case, how he lingered so long alive in the house. A very much smaller quantity than deceased bought would have been fatal; twenty drops would have killed him, and he bought six times that quantity, and his death would have been instantaneous almost had he imbibed the whole amount —he could not have lived over ten minutes, and probably it would not have been more than three or four minutes.

The Coroner said, after the evidence, seeing the doctor could not state positively the cause of death, he thought it would be necessary to adjourn the inquiry and have a *post-mortem* examination of the body made, and the inquiry was subsequently adjourned.

At the adjourned inquest,—

Dr. Henry Palk stated that upon opening the body the odour of prussic acid was most overpowering. He examined the heart and lungs, and found them healthy, but the veins gorged with fluid, dark-coloured, blood. This would be consistent with poisoning by prussic acid. He examined the stomach and found it contained a quantity of undigested food; the mucous membrane was somewhat congested. He took away a portion of the stomach and its contents, and had since analysed both, and found undoubted proofs of the presence of prussic acid, and he had no doubt at all that death arose from poisoning by taking prussic acid.

Mr. Gibson, the chemist who sold the acid, stated, in reply to the Coroner, that he was registered as a chemist in 1879. The Coroner, referring to the official Register of Chemists and Druggists, which he said was sent to him by the Secretary of State, and was supposed to contain a complete record of the certificated members of the trade, remarked that he could not see his name in the Southampton list; but Mr. Gibson said he was registered at Middlesborough-on-Tees, and he pointed to the record as giving his name there.

The Coroner asked Mr Gibson if he did not consider it his place to see that his name in the book was transferred to Southampton now that he lived there; but he replied that that was for the local secretary who assisted in compiling the book to look to. He had his certificate, not with him, but at his shop.

After the jury had consulted in private, the Coroner announced that the jury had arrived at a verdict that the deceased while of unsound mind killed himself by taking prussic acid. The Coroner added that the jury hoped that Mr. Gibson would be more careful in future in selling poison at his establishment without witnesses, a remark against which one of the jurors protested.—*Hampshire Independent.*

Correspondence.

Tincture of Hyoscyamus.

Sir,—Allow me to say that I do not consider there is a particle of evidence in Mr. Gilmour's paper to show that proof spirit is a better menstruum than rectified spirit for tincture of henbane. To compare the values of tinctures by their colours, amounts of extractive, and turbidity-giving property is quite valueless; when we know, as in this case, the active principle happens to be a colourless alkaloid. What is wanted is a determination of their alkaloidal values, and I suggest Mr. Gilmour's attention to this.

Another matter I would refer to is that Mr. Gilmour did not find his three weeks' old tincture had become acid, as I suggested it would do. My experience on this point is quite the contrary. I have before me samples of three tinctures of henbane, not an hour made; all are distinctly acid. I have another sample three weeks old; its acidity is most marked. I have purchased four other samples; all are acid. I may state generally that dried leaves give soluble matters having acid reactions.

With reference to annual and biennial henbanes, I regret with Mr. Gilmour that we have no means, seeing the broken state in which the annual is sold, of identifying it; but apart from this, what is most needed is accurate experiments on the comparative values of the two sorts; at present their reputations seem to rest almost solely on prejudice instead of scientific evidence.

University College Hospital, A. W. Gerrard.
London, W.C.

Pharmaceutical Apparatus.

Sir,—I have read with great pleasure the notes on pharmaceutical apparatus by Dr. Charles Symes, and I admire the simplicity and convenience of the arrangements figured. I have myself had to work with large and cumbersome apparatus where the skill of the man in connection with the pan was strikingly exemplified. I have to confess that modern ingenuity is in advance of ancient experience.

Yet I congratulate Dr. Symes on having had the courage to retain the form of still head which has been in use for centuries, and the pattern of which may be seen in Egyptian sculpture. It may be specially trusted in large operations and in the case of highly volatile preparations. When there might be a danger of overdrawing, the shape itself is an additional safeguard.

I base these remarks on two circumstances. First, that in continuous distillation during the season, we were uniformly successful with this shape, and not so with others. Secondly, when a few years ago small private stills of from two to four gallons capacity were introduced into several London families, no other shape was found equally safe or advantageous in domestic employment; that is, in inexperienced hands.

11, *St. Stephen's Avenue,* Joseph Ince.
Shepherd's Bush, W.

A Reader of the Graphic.—Probably a misprint for Mindererus spirit.

Xenophon.—The second line in the prescription is probably intended to be explanatory of the first. A form for "Chloroformum Belladonnæ" is given in Squire's 'Companion.'

J. C. Lloyd.—(1). The Throat Hospital formula for London Paste is "Caustic soda, unslaked lime, equal parts. Reduce to a fine powder in a warm mortar and mix intimately. Keep in well-closed bottles, and when required for use take as much as is sufficient and make into a paste with water." (2.) Probably, if the preparation is made by what is known as Fothergill's process.

Joe.—If you mean the "gelatine" material frequently used for the purpose, information respecting it may be found by referring to the indices of this Journal; but it will be well to bear in mind that is it claimed to be protected by a patent.

J. C. Wiggin.—A note on the use of caustic strontia in the sugar manufacture will be found in the *Pharmaceutical Journal* for Sept. 30, 1882, p. 263.

Communications, Letters, etc., have been received from Messrs. Schimmel, Wilkinson, Samuel, Crackncll, Grimwade, Dott, Elborne, Strachan, Antiseptic, Pharmacist, Apprentice, Amicus.

FLETCHERS' Concentrated Liquors.

Opinions of Pharmacists.

From **Mr. D. S. EYNON, Dispensing Chemist.** LEAMINGTON.

I find the several **Concentrated Liquors** I had from you in every respect most convenient and satisfactory. The Syrups made from them are excellent.

May 5, 1880.

From **Mr. TOM WATERHOUSE, Dispensing Chemist,** UXBRIDGE.

I have thoroughly tested your **Concentrated Liquors**, and I cannot speak too highly of them. I now use them, to the exclusion of all other similar preparations, in my dispensary. They save time, are very reliable, and come as a boon to dispensing chemists. I get them regularly through my drug house.

July 8, 1881.

From **Messrs THOMPSON & WALTON, Dispensing Chemists,** MAIDENHEAD.

You are aware we have, from time to time, supplies of your **Concentrated Liquors** from you. You will be glad to learn we have every reason to be satisfied with, and grateful for them. In our opinion, however anxious chemists may be to obtain what is termed 'accurate dispensing,' it is obviously impossible, in other than large centres, for them to supply, with reasonable assurance, the irregular and, it may be, small demand for the numerous Syrups prescribed now-a-days, except through agencies such as yours.

November 26, 1883.

From **Mr. H. HITCHMAN, Dispensing Chemist,** KETTERING.

I have used your preparations now for a considerable time with great satisfaction, more particularly the *Liq. Ferri Iodid.* and *Liq. Ferri Phosph. Comp.*, which form the best Syrups I have met with.

July 7, 1881.

From **Mr. S. LAWRENCE, Dispensing Chemist,** OBAN.

During the past year I have thoroughly tested most of your **Concentrated Liquors**, and have derived much satisfaction from their use, now finding my Syrups uniform in strength, appearance, and flavour; and as it is of the utmost importance that these qualities should predominate in all pharmaceutical preparations, I can confidently recommend your **Liquors** to all dispensing chemists.

Nov. 13, 1883.

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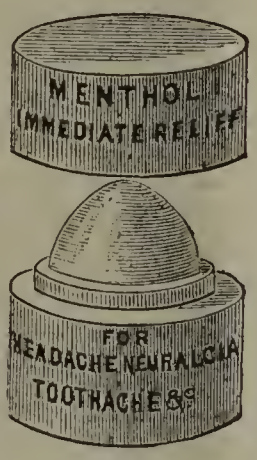

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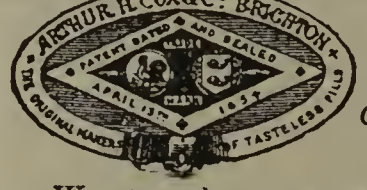

TASTELESS PILLS
(COX'S PATENT.)
Dated and Sealed April 13, 1854.
Chemists selling TASTELESS PILLS *have an advantage over others neglecting to do so.*

We strongly recommend our Aperient Pills at 6s. and Compound Rhubarb at 7s. per pound, coated, as saleable Pills. These, or any Pills in our list, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1d. in the Shilling will be allowed if Stamps or P.O.O. are remitted with order.

Twenty years' success, as proved by unsolicited Testimonials from Medical Men in almost every town and village in the kingdom, has produced imitations likely to bring a useful invention into disrepute, as a large percentage of the Varnished Pills made to imitate ours pass through the stomach unaltered.

The Registrar of Trade Marks (after giving the usual public notice prescribed by Parliament to allow of opposition) has granted us the above "Trade Mark," thus officially recognising us as the "ORIGINAL MAKERS OF TASTELESS PILLS," and no pills will be sent out without this mark on all bottles or packages.

Any Formulæ Dispensed, Covered, and Estimates given.

Samples, with a list of pills from upwards of 500 different forms which are kept in stock, will be forwarded free on application.

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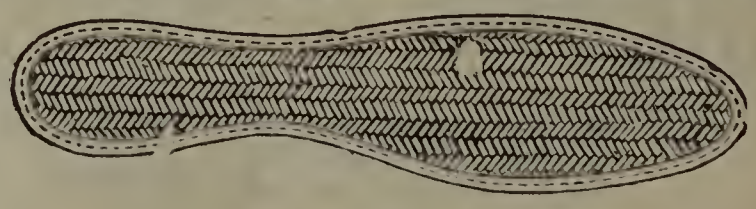

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Invite the attention of Chemists and others to the large variety of Glass Bottles, &c., that they supply, and solicit orders for same.

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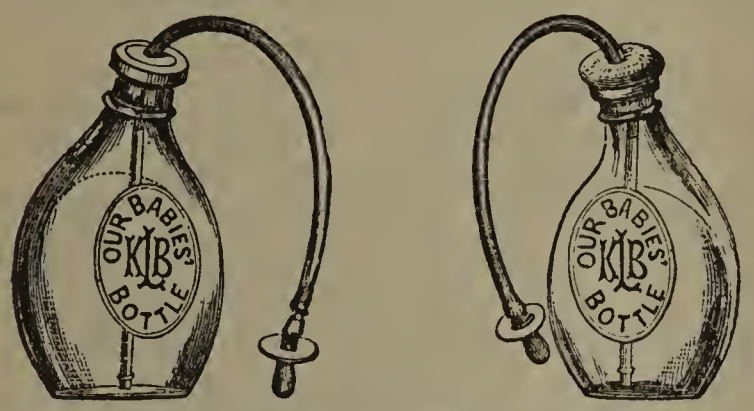
FEEDING BOTTLES.—"Our Babies' Bottle," in Green and White Glass, with white, brown or black fittings.



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ESTABLISHED 1824

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The CHOICE CHINESE SMALL TEA .. For Retail at 1/4.	**72**	per cent.
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The LONDON BROKEN TEA .. .. .. For Retail at 1/8.	**22½**	,,
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These well-known Teas, when ordered packed, are hand wrapped from the bulk, and forwarded on the day the order is received.

The extraordinary growth in the demand for them is due to the absolute regularity with which each excellent—probably unequalled—standard is maintained.

For samples, prices, and all particulars, apply to

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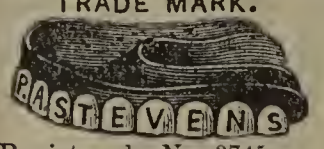

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PREPARED SILVERY WHITE

GUTTA PERCHA ENAMEL,

FOR STOPPING DECAYED TEETH.

P. A. S. can supply the above to Wholesale Houses, in any quantity, with their name stamped upon each piece, cut in sticks any length.

The above to be obtained of all Wholesale Houses. Price List and Samples sent Post Free.

Special Notice.—The words SILVERY WHITE GUTTA PERCHA ENAMEL are registered as a Trade Mark, and will be protected.

Certain Sudden **DEATH** to all Grubs, Aphis, Lice, Red Spider, Thrip, Mealy Bug, etc.

Perfectly Harmless to the Hands and Skin, but will cure Ringworm and all diseases produced by parasites.

FIR TREE OIL

(SOLUBLE) INSECTICIDE

A combination of Hydrocarbon Oils made Soluble in Water. **For destroying ALL INSECTS and PARASITES that infest Trees and Plants,** whether at the Roots or on the Foliage. It cures Mildew and Blight on Fruit or Foliage, and a weak solution Kills all Vegetable Grubs, Turnip Fly, &c. Cleans Grapes from Mildew or Mealy Bug without affecting the bloom; and, thickened with a little clay, makes a good winter dressing. Destroys Lice and Fleas on Animals. Sold by Seedsmen and Chemists, 1/6, 2/6, 4/6 a bottle. Per gallon 12/6, or less in larger quantities. Each bottle bears the inventor's Trade Mark (a Cat's Head) and full directions for use. Wholesale: Barclay and Edwards, London; Raimes, Edinburgh and York; Evans, Liverpool; and D. McLaren, Edinburgh.—New York: Rolker & Sons. *Manufacturer*, E. Griffiths Hughes, Manchester.

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CORN AND BUNION PLASTERS,

INVENTED AND ESTABLISHED BY

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SUPPLIED BY ALL WHOLESALE HOUSES.

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SPECIALITIES: Glycerine—Gum Arabic—Gum Tragacanth—Pure Beeswax—Gelatine—Glucose

JAMES'S FEVER POWDER,

Prepared by J. L. KIDDLE, Chemist,
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Sold in BOTTLES *containing* ONE OUNCE, *at* 4*s.* 6*d.*, *and* PACKETS *at* 2*s.* 9*d. each.*

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January, 1878. J. L. KIDDLE.

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Preferred to all Makes hitherto used.

In Cases of Twelve Six Yard Rolls, 2 inches wide, 3s. 9d.; 2½ inch, 4s. 6d.; 3 inch, 5s. 6d.; or, case containing twelve six yard rolls of each width, 13s.

Free by post, to any address in the United Kingdom, for prepaid orders only. Manufactured by

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BELGRAVIA TOOTH PASTE

Handsomely put up in large Jars. 1s. and 2s. 6d. each.
OF ALL WHOLESALE HOUSES.

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JOHN BEDDARD,

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Since its introduction as a substitute for the ordinary Rouge, a quarter of a century ago, the sale has amazingly increased both at home and abroad. A trial is only needed to prove its superiority over other Plate Powders in use. Sold in Boxes at 1s. and 2s.; Tins, 6s.

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RATTLESNAKE BEANS (*Simaba Cedron*).—A most powerful tonic, anti-periodic, anti-venomous and anti-epileptic, used with greatest success in Central America for fevers and poisonous bites. A few of these important beans just received. Price 3s. 6d. per bean.

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SODA WATER. LEMONADE.
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SELTZER WATER. *GINGER ALE.

** The best Ginger Ale in the Market.*

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Ellis's Ruthin Waters.
CRYSTAL SPRINGS.

Soda, Potass, Seltzer, Lemonade, Lithia, and for GOUT, Lithia and Potass.

CORKS BRANDED "R. ELLIS & SON, RUTHIN," and every label bears their trade mark. Sold everywhere, and Wholesale of R. ELLIS & SON, Ruthin, North Wales. London Agents: W. BEST & SONS, Henrietta St., Cavendish Sq.

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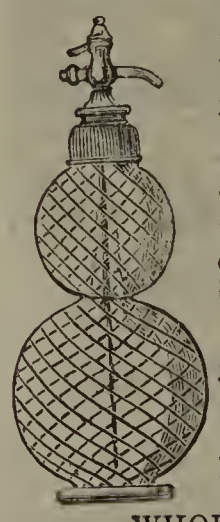
New Patent Lever Seltzogenes



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Liberal Discount.

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RAPID and thorough preparation, privately and in class. Postal Tuition for these Examinations and Bell Scholarship. For particulars, enclose stamp, Mr. A. DAWES, 1st B.A. Lond., Adderstone, Vardens Rd., New Wandsworth, S.W. (close to Clapham Junction Station.)

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BUCKLEY HOUSE, LLANDUDNO,
March 10th, 1884.

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Your course of teaching is so thorough, and your efforts to assist and wisely direct every student so unremitting, as to call for the highest praise.

I am, Gentlemen,
Yours very truly,
M. A. S.

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For full particulars apply to Messrs. WILLS & WOOTTON, Trinity Square, London, S.E.

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RESIDENT PUPILS can be received at any time for the June or July Minor. Success at each examination.

MINOR EVENING CLASSES on Tuesday, Wednesday, Thursday, and Friday, 7.30—10.0 p.m.

PRELIMINARY PUPILS received for the July Exam., in Class or for Private Lessons.

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Legal, Medical, Pharmaceutical, and Exams.

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225, OXFORD STREET, MANCHESTER.

Mr. W. S. TURNER, Pharm. Chem., M.P.S.

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I. DAY CLASSES.—Four hours' class, two hours' practical, *daily* £9 9 0

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III. EVENING CLASSES.—Four hours' class, two hours' practical, *weekly* £3 3 0

IV. PRELIMINARY CLASS.—Six hours' class, *weekly* £3 3 0

All fees include *all* chemicals and apparatus, no extra charge whatever being made.

Students desiring to join the classes for the June or July examinations are strongly advised to do so as soon as possible, in order to give themselves time to do the necessary work.

NOTE.—67 per cent. of Mr. Turner's men passed last year. There are now about 30 students attending the classes, being on an average 8 in any one class.

Students can obtain good rooms in houses known to Mr. Turner at a very reasonable rate.

WESTMINSTER COLLEGE

TRINITY SQUARE, LONDON, S.E.

The next Course of Lectures and Classes for Minor Students will commence on Monday, April 28th.

The next Course for Major Students will commence on May 1st.

Students of ordinary ability may rely upon passing in July.

FEES—MINOR OR MAJOR.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

June Exam. ... £5 5s. July ... £7 7s.
December ... £10 10s. 12 Months £15 15s.

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In order to secure the comfort of Students during their stay in College, Mr. Wills (Principal) provides a limited number of Students with comfortable and conveniently situated Apartments. Such Students meet for meals at Mr. Wills' Private Residence, Gladstone House, St. George's Road, Southwark.

Terms, Four Guineas per Month.

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Laboratory Instruction and Classes

Gentlemen engaged during the day, and unable to leave business, may be prepared for the Pharmaceutical Examinations in the evening.

The thoroughness of the teaching is proved by the large number of *Evening Students* who are continually being successful in passing their Examinations.

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MR. A. P. LUFF, B.Sc., F.I.C., F.C.S., F.L.S.

Botany, Materia Medica, &c.:

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Demonstrator:

MR. F. H. ALCOCK.

The next complete Course of Lectures and Classes will be commenced on April 28th.

FEE TO THE JUNE EXAMINATION ... £6 6
„ JULY „ ... 8 8

For Prospectus, &c., apply to

Messrs. LUFF & WOODLAND.

The Middlesex Hospital Medical SCHOOL.

SUMMER SESSION, 1884.

Lectures and Clinical Instruction in the Wards will commence on May 1st. Gentlemen can enter to any one course, or to Hospital Practice only. Two Entrance Scholarships, of the annual value of £25 and £20 respectively, tenable for two years, and a Science Scholarship, value £50, will be offered for competition at the beginning of the Winter Session.

For Prospectus, containing particulars as to other Scholarships, Resident Appointments, Fees, &c., apply to the Dean or the Resident Medical Officer, at the Hospital.

ANDREW CLARK, Dean.

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Mr. JAS. W. SAUNDERS

(*From the Royal School of Mines*),

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As each Student is taught and works *separately*, entry may be made at any time. Individual personal attention. No Demonstrators. Postal teaching. Enclose stamp for terms, &c.

LABORATORY CLOSE TO GOWER STREET STATION.

"SYSTEMA OMNIA VINCIT."

SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing April 15th.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

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PHARMACEUTICAL JOURNAL.

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7000 Copies Weekly.

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1.—That Advertisements are received at the Publishing Office (as below) not later than ten o'clock on Thursday morning, and they must be prepaid.

2.—That letters addressed to initials or to fictitious names at a Post Office are not taken in, but are at once sent back to the writers by the Post Office Authorities.

3.—That all letters respecting the insertion of Advertisements should be endorsed on the envelopes "**PHARM JOURN,**" and must be sent only to the Publishers.

Estimates for Advertisements, in Wide or Narrow Measure, for Single insertion or for Series, will be sent on application to the Publishers.

The Journal is supplied post free to any part of the United Kingdom, on prepayment of 20*s.* for twelve months ; 10*s.* for six months ; single copy 4½*d.* To the Colonies and Abroad, 22*s.* per annum.

J. & A. Churchill, 11, New Burlington St., London, W.

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Advertisements for the next issue must be sent on Tuesday. See notice on page iv.

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AS Manager of Branch, town or country. Registered. Good references. A permanency preferred. W. H., 21, Hill St., Hastings.

AS Junior. With time for studying preferred. 5 years' London and country experience. Age 21. Good references. Disengaged. W. R., 3, Goswell Rd., E.C.

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AS Junior or Dispenser. Age 19. Over 4 years' varied experience. Good references. C. D. N., The Pharmacy, Bournemouth.

A YOUNG Pharmaceutical Chemist (German), who has been employed in first-class German and Swiss houses, and is fairly acquainted with the English language, desires to make himself useful in a good London Dispensary. Remuneration not essential. G. K., care of Housekeeper, 24, Coleman St., E.C.

LOCUM Tenens or Temporary Assistant. Qualified. By the day, week or month. Town or country. Chemicus, 51, Judd St., St. Pancras, W.C.

AS Manager. Permanency or view to succession preferred. Qualified. 11 years' experience. Good references. Age 24½. Chemicus, 1, Belmont Ter., King's Rd., Guernsey.

AS Junior. Age 19. 4 years' experience in good class busine s. John Home, 4, Swan Hill, Shrewsbury.

ASSISTANT. Minor qualification. Tall and of good address. Age 25. First-class references. Good London experience. Out-door. Has a knowledge of French. Longstaff, 40, Berwick St., Pimlico.

BY a Pharmaceutical Chemist, as Dispenser or otherwise. Disengaged. W. J. Williams, Mr. Roberts, Llangunider, Crickhowell.

AS Manager. 6 years in present situation. Good Prescriber and Tooth Extractor. Excellent references. Age 37. Married. At liberty May 2. J. S. Stark, Messrs. Worboys & Son, 76, Charlotte Ter, Lambeth, S.E.

AS Senior. Minor qualification. 11 years' experience, West-end and first-class provincial. Age 26. Height 5ft. 9in. A. B., 29, Newcastle St., London, W.C.

AS Junior, in a good Dispensing business. 5 years' experience. W., 16, New St., Huddersfield.

TEMPORARY. Ætat. 31. Town or country. By day or week. Thoroughly experienced in all branches. Irreproachable references. Terms moderate. Disengaged. A. Wood, 7, Woodfield Cres., Harrow Rd.

WHOLESALE.—Advertiser seeks employment in Wholesale Drug or Drysaltery Warehouse. Age 25. Over 9 years' experience. Good references. Wholesale, 4, Ben St, Radford, Nottingham.

AS Assistant, in good-class Dispensing business. London or seaside. 5½ years' experience. Height 5ft. 11in. Assistant, Mr. Asling, Bridge St., Spalding.

AS Manager, by a Pharmaceutical Chemist, with first-class experience and highest references. Open to a temporary engagement. Pharmacist, 7, Argyle Villas, Grove Rd., Windsor.

AS Temporary Manager or Assistant. Many years' experience in London and country. First-class references. Disengaged. Chemist, Milton Villa, Shaftesbury Road East, Hammersmith, London, W.

AS Junior. Where two are kept preferred. Over 4 years' experience. Age 19½. Passed Prelim. A. H., 2, Warren St., Devonport.

AS Junior, in good Dispensing and Retail business in London. Age 20. Height 5ft. 5in. Passed Prelim. Now disengaged. N. or N.W. preferred. P.D., 19, Aldine St., Shepherds Bush, London, W.

WITH Surgeon, or in light Retail. 5 years' experience Dispensing and Prescribing. Excellent references. Age 25. London or North preferred. Small salary. Walters, 24, Copenhagen St., N.

AS Assistant or Manager of Branch. Minor and Apothecaries' Hall Exams. 15 years' varied experience. A. P. S., 1, Eddison St., Leathley Rd., Leeds.

ENGAGEMENTS WANTED.

AS MANAGER, temporary or permanent. Married. Experienced in Prescribing and Dentistry. D., 1, Marion Villa, Strode Rd., Forest Gate, Essex.

OUT-DOOR.—DISPENSER to Surgeon or to MANAGE Branch. Age 25. Height 6ft. Over 9 years' good experience. Can Prescribe and Extract Teeth. F. O., 31, Regent Sq., W.C.

JUNIOR or DISPENSER. 12 years' town and country experience. Age 25. Height 5ft. 10in. Out-door preferred. W. PANNIERS, 46, Kilton St., Battersea Park Rd.

AS ASSISTANT. Age 25. Height 5ft. 7in. Good references. R. M., 107, Curzon St., Leicester.

ASSISTANTS WANTED.

Advertisements for the next issue must be sent on Tuesday. See notice on page iv.

AS APPRENTICE, where a knowledge of every branch of the business will be obtained, an educated youth. One who has passed the Preliminary preferred. Apply, MELLOR, Dispensing and Family Chemist, St. Neots, Hunts.

MR. HERBERT CLARKE, 10 Cannon St., Dover, has a vacancy for a well educated and gentlemanly youth as APPRENTICE. Must have passed the Preliminary. Every facility and help given to thoroughly master the profession in all its details.

APPRENTICE.—C. PICNOT, Pharmaceutical Chemist, Strood, Rochester, has a vacancy for a well educated youth as an APPRENTICE. One who has passed the Preliminary preferred. Comfortable home and every opportunity given for acquiring a thorough knowledge of the business.

APPRENTICE.—F. K. MORRELL, Chemist, 306, Kennington Park Rd., London, S.E., has a vacancy for a well educated youth. One who has passed the Preliminary preferred. Comfortable home and every opportunity given for acquiring a thorough knowledge of the business. Term 3 years. Premium 50 guineas.

ON or after April 8.—A young man, about 21 years of age. One that can Dispense accurately, and used to a Mixed light country business. Apply, with references, salary required, &c., to THOMAS DIXON, Chemist, Rickmansworth, Herts.

AN energetic and obliging out-door ASSISTANT, about 25 years of age. One who has had experience in soliciting orders from shopkeepers preferred. No Sunday work. One who desires to please will find this a comfortable place. Address, J. B. L., care of Wyleys & Co., Coventry.

ASSISTANT, out-door, not under 25, for general country business. Junior kept. Address, with portrait and full particulars, to G. B., 30, Duke St., Manchester Sq., London, W.

A JUNIOR ASSISTANT. Out-door. Age about 22. Apply, with carte (to be returned), and full particulars, to C. G. TARGETT, Chemist, Weymouth.

AN ASSISTANT, age about 23, for a light Retail business. In-doors. Apply, with full particulars, THOMAS PARKER, 9 & 10, Bridge St., York.

BY a Chemist's widow, at once, a competent and qualified ASSISTANT, to have sole control of the business. One with a knowledge of the Welsh language preferred. Apply, stating particulars, to A. E. EVANS, Chemist, Brynmawr, R.S.O.

HAIRSINE & CO., 47, Haymarket, London, require an ASSISTANT, about 24 years of age, with Minor qualification.

ASSISTANTS WANTED.

SENIOR ASSISTANT, out of doors. No Sunday duties. Apply personally at 143, Hackney Rd.

IMMEDIATELY.—A qualified in-door ASSISTANT, obliging, with good business habits, and willing to make himself generally useful. State age, references, experience, and salary required. Abstainer preferred. WM. BACKHOUSE, 34, Upperhead Row, Leeds.

MESSRS. HAMILTON, LONG & CO., State Apothecaries, Dublin.—A Junior ASSISTANT (in-doors). Apply personally to Mr. Postans, Chemist, 35, Baker St., W., or by post to Dr. HAMILTON, 3, Lower Sackville St., Dublin, stating age, references, salary required, and enclosing carte, to be returned.

A THOROUGHLY competent ASSISTANT, who has had experience in first-class Retail and Dispensing. One only kept. Apply, with full particulars, enclosing carte, to J. CLARKE, Pharmaceutical Chemist, Croydon.

A QUALIFIED ASSISTANT, about 25 years of age. Apply to WILLIAMS & ELVEY, Halkin St. West, Belgrave Sq.

IMMEDIATELY.—An ASSISTANT, from 25 to 30 years of age, accustomed to light Retail, Dispensing and Prescribing. Address, with full particulars as to height, salary required, &c., enclosing carte, J. W., 3, Hill Ter., Sutton, Surrey.

ASSISTANT. About 22. Well up in his business. Height, salary required, carte and all particulars, to E. C. ASHFORD, Chemist, Northampton.

BRADLEY & BOURDAS require an ASSISTANT, with Minor qualification, accustomed to Dispensing. Apply personally, before 11 a.m., at 6, Pont St., Belgrave Sq., S.W.

A THOROUGHLY competent Junior ASSISTANT, about 22 years of age. One who has served apprenticeship in a good Dispensing country business preferred. Apply to Messrs. HOOPER & Co., 24, Russell St., Covent Garden.

ST. Marylebone General Dispensary, 77, Welbeck St., Cavendish Sq.—DISPENSER required. Must have at least the Minor qualification of the Pharmaceutical Society. Salary 30s. per week. Hours 10 to 5. No Sunday attendances. Written application, with testimonials, to be forwarded to the Secretary not later than Friday, 18th April, 1884. FRANK STOKES, Secretary.

JUNIOR ASSISTANT, at once, at Apothecaries' Hall. Out of doors. London reference required. Apply to Mr. MATTHEWS, Apothecaries' Hall, London, E.C.

BY the 28th inst.—A steady, obliging, trustworthy ASSISTANT. In-door. Must be strictly moral and sober. Hours of business light. No Sunday duty. One accustomed to a country trade. Apply, stating age, height, and salary, with references, to W. STEWARD, 42, High St., Bridgnorth.

JUNIOR out-door ASSISTANT, for Retail counter. Hours of business, 8 a.m. to 9 p.m., Saturdays excepted. Apply, WM. FOX & SONS, 109 & 111, Bethnal Green Rd., London.

GMILES, Chemist, Belvedere, Kent (10 miles from City), will require an ASSISTANT about the 20th inst.

ON April 15th.—An ASSISTANT, age about 22. Must be a quick and accurate Dispenser and accustomed to light Retail business. No time given for study. Address, by letter only, with reference, age, height, salary, &c., to ALPHA, High St., North Finchley. Letters unanswered in three days consider declined.

AT once.—Two energetic ASSISTANTS, of gentlemanly appearance, accustomed to good class Dispensing and Retail. Must have good references of moral character, ability, &c. Apply, enclosing carte, to J. GELDART, Chemist, Liverpool.

ASSISTANTS WANTED.

AN ASSISTANT for May 1st., about 22, for light Retail business. Send photo., with usual particulars, to JOHN EVANS, 2, Bath Parade, Bristol.

A JUNIOR, accustomed to Dispensing and light Retail. Personal application, or full particulars, with carte, to E. PEARSON, 25, Aigburth Rd., Liverpool, S.

AN ASSISTANT, about 24 years of age. Neat and accurate Dispenser. Apply, with usual particulars and carte (to be returned), W. T. FROST, 125, Lee Rd., Blackheath, S.E.

ASSISTANT, for the 22nd inst. In-door. Age about 23. Must be a neat writer. Well up in Dispensing and accustomed to good class Retail. One desiring a permanency preferred. Apply personally if possible, or write, enclosing carte, stating age, height, salary, &c., to C. DAVIES, 8, Union Ter., Notting Hill, London, W.

A JUNIOR, for 3 months. Accustomed to a mixed family business. Time for study. Apply, with usual particulars, to WM. E. COOPER, High St., Upton-on-Severn.

ST. LEONARDS.—April 28th.—A thoroughly competent ASSISTANT, for Dispensing counter. Apply, with carte and usual particulars, J. & C., Harold Pl., Hastings.

A GOOD Senior ASSISTANT, not under 24 years of age, accustomed to first-class Dispensing business. Also a JUNIOR, who would have to keep the books and assist at the Dispensing counter. State age, height, salary, and last situation. Address, Messrs. GIBBS & GURNELL, Ryde. All letters not answered in three days may be considered as declined.

IN a good-class country business (South), a steady and polite ASSISTANT. Salary £30 to £40, in-door. Hours of business light and no Sunday work. EPSILON, care of Messrs. W. Sutton & Co., Bow Church Yard, London.

SHROPSHIRE.—For first-class Dispensing and Grocery business, an experienced gentlemanly ASSISTANT, of good character and ability. Salary liberal. In-doors. Apply, with carte and full particulars, to R. E. X., Claremont, Rhyl, North Wales.

IN-DOOR Junior ASSISTANT, in old established country business, possessing a knowledge of Dispensing, and writing a good hand. Unexceptionable references required. Apply, stating age, height, experience, when at liberty, and salary required, to FLEEMING & SON, Pharmaceutical Chemists, Wolverhampton. Applications not answered within three days declined.

SENIOR ASSISTANT, about 30, from May to August. Tall, obliging, able to Prescribe and Extract Teeth, and take entire charge, as the principal is leaving for his health. Salary £4 10s. per month. Board, lodging and comfortable home. First-class references required. CHEMIST, 6, Abney Park Ter., Stamford Hill, N.

BIRMINGHAM and Midtand Eye Hospital.—Wanted, a DISPENSER, who must be either a member of the Pharmaceutical Society or able to produce evidence of having been actively engaged in Dispensing for a period of three years. He will be required to attend at the Hospital on week days from 8.45 a.m. till 6 p.m., and on Sundays at 12.30 p.m. Dinner will be provided. Salary £70 per annum. Applications, with tkstimonials, to be sent to the Secretary, from whom information as to duties may be obtained, not later than the 15th day of this month.

By order,
CRANMER GELL, Secretary.

Committee Room, Temple Row, Birmingham,
April 3rd, 1884.

AN IMPROVER or Junior ASSISTANT, for a country business. Apply, stating salary, &c., to JAMES STEVENS, 19, High St., Strood, Kent.

ASSISTANTS WANTED.

MANAGER, to take charge and reside upon the premises. Age between 25 and 35 years. Must have good references, and able to Prescribe. Apply to C. B., Messrs. Evans, Gadd & Co., Exeter, stating if married, salary required, &c. Applications not replied to in three days declined.

WHOLESALE.—Experienced ASSISTANT for Wet Counter. Must know the business thoroughly and be well recommended. For house in Edinburgh. £30 to £ 00. Apply, stating age, experience, &c., to OMEGA, Messrs. Horner & Sons, Mitre Sq., Aldgate, London, E.C.

BY the 20th April.—An ASSISTANT, about 25 years of age, who is competent to Prescribe, Dispense, and Extract Teeth. Must have been accustomed to a good Agricultural trade, and possess a good knowledge of Horse and Cattle Medicines. Apply, with references, to JOHN WILLIAMS, Chemist and Veterinary Surgeon, Bridge St., Usk.

COMPETENT in-door ASSISTANT. Must be a good Dispenser and Counterman. State age, salary required, references, &c. (enclosing carte), to HICKS & Co., Duke St., Cardiff.

A QUALIFIED ASSISTANT, not under 22 years of age, for a first-class Dispensing business. Must be a quick and accurate Dispenser. In-doors. Junior kept. Full particulars with carte (to be returned). A. GREENALL, 10, South Rd., Waterloo, Liverpool.

AN ASSISTANT, about 24. Must be a neat and accurate Dispenser. Minor qualification preferred. Apply to VINCENT & SON, Walham Green, S.W.

IMMEDIATELY.—A competent in-door ASSISTANT, an accurate Dispenser and good Counterman, for a first-class Retail and Dispensing establishment in Yorkshire. Two kept. Address, stating age, height, references and carte (to be returned), X.Y.Z., care of Messrs. Herrings & Co., Aldersgate St., London.

IMMEDIATELY.—A competent ASSISTANT. One seeking permanent situation preferred. Must be sharp, neat and accurate Dispenser. Commencing salary £50, in-door. Apply, with carte, to R. THOMAS, 38, Linnet Lane, Liverpool.

C. GARRAD, Leamington, requires immediately an ASSISTANT well up in Dispensing. In applying please be as explicit as possible, and send carte if convenient. The Sunday duty is equally divided between three.

AN ASSISTANT, for light Retail and Dispensing business, where one only is kept. Time allowed for study if desired. Must be steady, active and obliging. Application personally preferred, or by letter, stating usual particulars, to Mr. R. BAXTER, Pharm. Chemist, Huntingdon.

AN ASSISTANT, age about 23 years, able to Extract Teeth, for a light Retail and Dispensing business. Apply personally, or by letter with full particulars, to P., Messrs. W. W. Flood & Co., 102 & 103, Blackman St., Borough, S.E.

A JUNIOR ASSISTANT, for a Dispensing business. Apply, stating age, experience, reference, and salary required, to Mr. J. S. WARD, Pharm. Chemist, 36, Oxford St., Liverpool.

IMMEDIATELY.—An ASSISTANT, of good address and accustomed to Dispensing. Personal interview preferred. Apply, T. W. LEAKE, 44, Hampstead Hill Gardens, N.W.

BLACKPOOL.—Immediately.—A good ASSISTANT, well up in the business, able to Extract Teeth. Must be thoroughly trustworthy. None need apply whose antecedents will not bear strict investigation. Apply, stating age and other particulars, to ALFRED P. GARLAND, Pharmaceutical Chemist, Blackburn.

BUSINESSES FOR DISPOSAL.

Advertisements for the next issue must be sent on Tuesday. See notice on page iv.

IN the S.E.—PHARMACY. £4 per week. Well stocked. Rent £30. Price £75. Opening for a Surgeon. No opposition. Full prices. Introduction. Or, will exchange, with difference. S., Barron, Harveys & Co., Giltspur St., E.C.

AT a low price for immediate cash.—An old-established BUSINESS, in one of the busiest parts of Oldham. Apply to Mr. HARRY WILLIAMSON, Chartered Accountant, 24, Kennedy St., Manchester.

A RETAIL BUSINESS, in the very best thoroughfare in Derby. A steady business doing. Owners going into Wholesale business only. Rent £80. A capital opportunity. Apply, EDWIN BELFIELD, Auctioneer, Derby.

NORTH Wales.—An old-established BUSINESS, in a favourite seaside resort. Returns have been over £600, but have slightly fallen through neglect. In the hands of an energetic man would easily exceed all previous figures. Satisfactory reasons for selling. Rent £30. Price £275. CHEMIST, Wilson House, Goosegate, Nottingham.

SOUTH Devon.—BUSINESS. Returning nearly £500 per annum. Rent £35. Good town, and class of trade. Shop well fitted. Price to cash purchaser £110. Illness cause of sale. Apply, H. GADD, 97, Fore St., Exeter.

FIRST-CLASS Retail and DISPENSING, in fashionable and rapidly increasing part of Brighton. Returns under disadvantageous circumstances £660, and capable of being considerably augmented. To a man of good business qualities and address this presents a most desirable investment. Price about £650. F. J. BRETT, Leicester.

GOOD opening for beginner.—Middle and working-class cash neighbourhood. Pretty suburb of London. Dense locality. Long lease at £40 rental. If a knowledge of Dentistry the better. F. EVES, Esq., 7, Bradmore Park Ter., Shepherd's Bush, London, W.

TO Chemists and Druggists, Drysalters, Oil and Colourmen.—Wholesale and RETAIL, or Retail alone. A valuable old connection (the owner retiring) can be secured by an incoming tenant taking whole or part of the stock at valuation. Invoice about £1500, but less by arrangement. Rent of all premises, £112. Retail shop in very busy thoroughfare. Apply to W. H. PHILLIPS, 1, Small St., Bristol.

£600, or reasonable offer.—Lancashire coast. Dispensing and Family RETAIL. Returns last year £645. New prescriptions 655. Best prices. Valuable lease. Rent £35. Convenient premises. Shop well fitted and stocked. Selling to succeed a relative. This is thoroughly genuine. Every investigation offered, and reference to Wholesale houses if required. L., Ayrton & Saunders, Liverpool.

DEATH sale.—By order of executors. A superior class Dispensing and most profitable RETAIL. 3 miles from Charing Cross. Surrey. Main road. Post Office connected, paying £50 year. Upwards of 500 Prescriptions dispensed yearly. Full prices for everything. Profits average between £300 and £400 year. Large house, garden, side and back entrances. Price £500 (£400 might remain a year at 6 per cent). Shop handsomely fitted by Treble 5 years ago. Being bonâ fide bargain, no letters will be answered unless they contain bankers or other references. EXECUTORS, care of Bourne & Taylor, 35, Castle St., Holborn.

DRUG and light Grocery TRADE, in one of the best situations in North Wales. Returns over £1200. In present hands 17 years. At valuation, about £500. Apply, H., Messrs. Evans, Sons & Co., Liverpool.

BUSINESSES FOR DISPOSAL.

IMMEDIATELY.—A good Retail and Dispensing BUSINESS, with Post Office attached, which pays rent. There is room for increase, and a good house attached. Good reason for disposal. Apply, W. O. P., Messrs. Woolley, Sons & Co., Manchester.

MARKET Harborough, Leicestershire.—Immediately. Death vacancy. An old established Retail Chemist and Druggists' business. The shop is in an excellent position in the main street. Lease 7½ years' unexpired. Address, Mr. J. H. DOUGLAS, Solicitor, Market Harborough.

LIVERPOOL.—Rare opportunity for succeeding to a good Dispensing and light Retail BUSINESS, with large scope for increase, and a good opening for Dentistry. Last year's Prescriptions, with repeats, near 3000. The Pharmacy is perfect, and fitted throughout with mahogany. Serious illness compelling vendor to live off the premises in the country. To an immediate purchaser he will accept for stock, fixtures, &c., £600. £250 to be paid down, and the remainder in easy quarterly instalments. Address, H. T., care of Messrs. Hodgkinsons, 198, Upper Whitecross St., London, E.C.

CHEMIST'S (old-established) Retail and Prescribing BUSINESS for immediate disposal. About 12 miles from London. Thoroughly genuine. Satisfactory reasons given for leaving. Mr. J. SELLERS, 17, Farringdon Rd., London, E.C.

A GOOD class light Retail and Dispensing BUSINESS London suburb. Returns £600. About a year's returns required to purchase. This offers a good opportunity to an energetic man as the business is capable of very great extension. Several good Proprietary Articles. Address, B. H., care of Messrs. Hearon, Squire & Francis, 5, Coleman St., E.C.

PORTSMOUTH. — Profitable light RETAIL. Good position and scope for doing large trade. Incoming under £300. Exceptional opening for Dentistry. Satisfactory reasons for disposal. Address, in first instance, H. LOCKE, 30, Cross St., Portsea, Hants.

COVENTRY.—Light RETAIL. Good corner shop. Rent £20. Present hands 11 years. Vendor succeeded to larger concern in native town. Cash £105. Bargain. W. LITCHFIELD, Chemist, Stafford St., Longton.

FROM ill-health. — A large and profitable country BUSINESS, combining Drug, Grocery, Seeds, Wines and Sprits. Premises will be sold, or let on long lease at low rental. Capital required to cover stock, about £1200. Full prices obtained. Good opening for Aërated Waters. Returns will show suitability for two energetic young men to work both Wholesale and Retail through the neighbourhood. Applications, B. C., care of R. Sumner & Co., Wholesale Druggists, Liverpool.

IN one of the leading market towns in Lancashire.—A thoroughly genuine Retail, Dispensing and Prescribing BUSINESS. Doing a good trade. Capital scope for increase. Satisfactory reasons for disposing of same. Rent and taxes under £40. For further particulars apply A. B., Evans, Sons & Co., Liverpool.

TO Chemists or Medical Men. — Modern first-class Freehold, with Chemist's BUSINESS. House and shop adjoining, with land. Whole forming a compact property. Part of purchase money can remain on mortgage. Bargain for parents desiring to put their son in business and invest capital. Apply, Mr. JOHN LEES, Auctioneer, Reigate.

THROUGH ill-health. Returns £800. Double-fronted, plate-glass front. Rent £55. 18 years lease to run. Net profits £350. Near large railway station. Trams from all parts pass the door. Price £650. For particulars apply to Mr. WALLIS, Davy, Yates & Routledge, 64, Park St., London.

BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer:—Somerset. Unopposed. Returns £1200, full prices. Good house, ¼ acre of garden, only £750. Gloucester (most picturesque part of). Good class Trade. Returns £600. Good house and garden, only £400. Must sell through illness. Hereford. Well-fitted Retail. Returns £500, net profit £200. For £300. Yorkshire. Mixed business. Returning £2000, net profit £600. £1500, third might remain. London, S.W. Retail and Dispensing. Returning £1100, net profit £500. Owner retiring. £1100. S.E. Retail and Prescribing. Returning £550. Well-fitted and stocked. £450. N. Corner Retail. Returning £5 weekly. Only £95. Please apply, 30, Jury St., Aldgate, City.

HAMPSHIRE.—A good light Retail, Dispensing and Prescribing Business. Returns over £300. Increasing. Double-fronted corner shop. Mahogany fittings, and well stocked. Rent £40. On lease. Good dwelling-house. Price to be arranged. No agents answered. Owner taking larger business. Address, A. R., Messrs. Hodgkinsons & Co., 198, Upper Whitecross St., London.

A FIRST-CLASS ready-money Business, doing over £600 per annum. To be disposed of at once for about £500. Shop well-fitted and stocked. In one of the best market thoroughfares in London. Address, letter only, X. Y. Z., care of Mr. A. Trotman, 55, Lillie Rd., West Brompton.

WANTED TO PURCHASE.

BY a Pharmacist.—Good class genuine Concern. Returning at least £1000. Must bear every investigation. Partnership or Mineral Water Business would be entertained. Principals only treated with. Enterprise, Wesley House, Broad St., Nottingham.

FOR SALE.

A SECOND-HAND mahogany plate-glass Counter Case, 4ft. long, with sloping shelves, as fig. A 7; as fig. A 8, 5ft. 6in. long; 5ft., 6ft., and 7ft. mahogany circular fronted plate-glass Counter Cases, as fig. A 18, all a great bargain; mahogany Writing Desk and plate-glass Case, as fig. A 32, price £2 15s.; a upright glass Case, 4ft. 9in. long, 1ft. 9in. high, 9in. deep, opens with 2 glass doors, price 20s.; 4ft., 6ft., 8ft., and 12ft. run of mahogany fronted Drawers, with glass knobs and gold labels, at 2s. per drawer; a 6ft. Spanish mahogany plate-glass Dispensing Screen, fig. A 55, £6; a quantity of small fancy Show Jars, all very cheap. Bygrave, 12, Curzon St., Wenlock St., New North Rd., Hoxton, London, N.

STOPPERED ROUNDS, DRAWERS, &c.

250 32 and 40 oz. W. and N. stoppered Rounds (second-hand), labels, in working condition, price 9s. per doz 100 pint do. do., 7s. 6d. per doz. 50 half-pint do. do., 6s. per doz.

One range of 160 second-hand dovetailed Drawers, stained mahogany and varnished, new gold labels and glass knobs, total length 17ft., or would cut in two lots, price 1s. 6d. per drawer.

12ft. range of 108 Drawers, stained mahogany and varnished, gold labels and glass knobs, price £8.

Apply to R. Tomlinson, Druggists' Shop Fitter and Dealer in Druggists' Sundries, 15, St. Paul's Square, Birmingham.

TO CHEMISTS AND DRUGGISTS.

MESSRS. DRIVER & PERFECT'S next Sale of Drugs will take place on Wednesday, May 7th, 1884. Chemists and others wishing to include Stocks or Fixtures should send particulars at once. Auction Offices, 8, Seven Sisters Rd., Holloway.

HENRY GADD,

Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

97, FORE STREET, EXETER.

Henry Gadd having had many years' practical experience of the

WHOLESALE AND RETAIL TRADE,

in Town and Country, can offer his services for Transfers, Probate, Valuations, Arbitrations, &c.

He has on his Register many businesses, returning from £100 to £3000 per annum. Several offered for a valuation of stock and fixtures only, affording specially safe and profitable investments.

No charge to purchasers.

Applications for either the sale or purchase of Businesses inserted in Register free of charge.

ARTHUR HUNT, M.P.S.

Licensed Chemists' Valuer,

95, FORE STREET, EXETER,

Has received instructions to offer the following valuable businesses:—

1. In the centre of an aristocratic neighbourhood in the best position in a town in South Devon.—A first-class Dispensing and profitable Retail. Proprietor, who is retiring, will give full introduction. Price £750.
2. Owing to the death of the proprietor. 22 years in same hands. In a good market town in Somerset.—A very profitable light Retail, Dispensing and Prescribing Business. Profits nearly £400, which includes post office commission (about £26 per annum)—could probably be continued if wished. Proprietor has for years carried this business on at very small outlay.
3. In a first rate market town in Devon.—An easily worked Retail Business. Price about £120. Stock, all fresh and new, worth much more than sum asked. A rare chance for a young man with small capital. Proprietor going into the Dental profession. Returns £400 to £500.
4. In a small town in Cornwall.—Proprietor having a lucrative opportunity abroad would part on easy terms with Business. Returning between £400 and £500 per annum, mostly Drugs. No heavy trade.

Arthur Hunt solicits enquiries from gentlemen requiring either to sell or buy businesses.

FOR IMMEDIATE SALE,

IN PART OR WHOLE. HIGHEST OFFER ACCEPTED.

Muspratt's Chemistry, vol. i., Ace—Eth.; vol. ii., Fuel—Zinc.
L'Officine de Pharmacie Pratique, "Dorvault."
Pharmaceutical Journal, 29 volumes, from year 1841-70.
Hahnemann—Doctrine Homeopathique. Vols. iii.
Pharmacopeia Universalis, by Phil. Laur. Geiger and Carol. Frid. Mohr.
Pharmacopeia Universalis, vols. ii., by A. J. L. Jourdau, M.D. of Paris.
Supplement to the Pharmacopeia. Gray. Two books.
All well bound and in good order.
Chemistry—Theoretical, Practical and Analytical, as applied to the Arts of Manufactures, by Writers of Eminence. Twenty-one 2s. parts.

John Lewis, 140, High Street, Sydenham, London.

Advertisements for the next issue must be sent on Tuesday. See notice on page iv.

Messrs. TAYLOR & CO.

Chemists' Transfer Agents & Valuers,

WALBROOK CHAMBERS, 38, WALBROOK, LONDON, E.C.

HAVE THE FOLLOWING BUSINESSES FOR DISPOSAL:—

1. LANCS.—Wholesale and Retail PHARMACY, fitted in handsome style. Low rent. Returns over £1000. Post Office pays rent. Price £50 goodwill and valuation of stock and fixtures.
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3. LONDON, W.—Retail, Dispensing and PRESCRIBING. Returns about £530. Price £450.
4. LONDON, E.—Middle-class ready money Retail and Prescribing BUSINESS. Returns £500. Price £300. Rent only £30 per annum.
5. LANCS.—Light Retail, Dispensing and Prescribing BUSINESS. Corner premises. Returns £300. Price £275.
6. LONDON, E.C.—Surgeon's RETAIL. Returns about £3 a week by an Assistant, capable of great improvement with proper attention. Price £175.
7. CHESHIRE.—Retail and DISPENSING (no heavy trade). Over 700 new prescriptions copied in 1883. Returns £440. Price £275.
8. SURREY (near Town).—Prescribing, Dispensing and light RETAIL. Double fronted corner shop well stocked and fitted. Returns about £5 a week. Price £220. Rent only £30 per annum.
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10. ORKNEY ISLES.—Good Drug BUSINESS, combining Veterinary Medicines. Returns about £500.
11. BERKS.—Dispensing, Prescribing and general RETAIL. Established by vendor. Single fronted shop with plate-glass window. Returns £700.
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Advertisements for the next issue must be sent on Tuesday. **See notice on page iv.**

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 720.] SATURDAY, APRIL 12, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

SPECIAL NOTICE.

Wednesday, April 30th, is the last day on which the Secretary can receive Subscriptions.

EXTRACT FROM THE BYE-LAWS.

SECTION 1, CLAUSE 10.—"All Subscriptions for the Current Year shall become due upon election, and *all Annual Subscriptions shall become due on the first day of January in every year*; and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the first day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society, certified by the Council at the Annual Meeting."

SECTION 17, CLAUSE 3.—"Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the Certificate or Diploma of Membership, if any, held by him. *No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the Certificate or Diploma of Membership, if any, shall have been returned.*"

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This Examination will be held throughout Great Britain, at 11 a.m., on the **second Tuesday** in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

* A Certificate of having passed any of the examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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17, Bloomsbury Square, London, W.C.

NOTICE TO ADVERTISERS.

GOOD FRIDAY occurring this week, the "Pharmaceutical Journal" is published on Thursday instead of Friday. Advertisements which arrived after Ten o'clock on Wednesday Morning were too late for INSERTION IN THIS WEEK'S ISSUE; they shall appear in the number for April 19.

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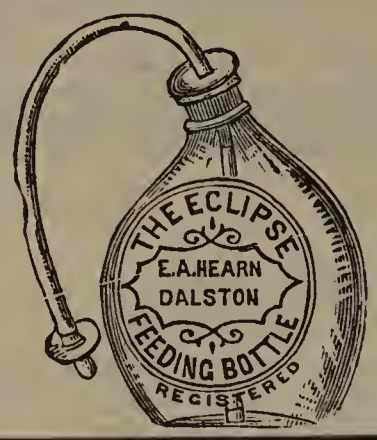

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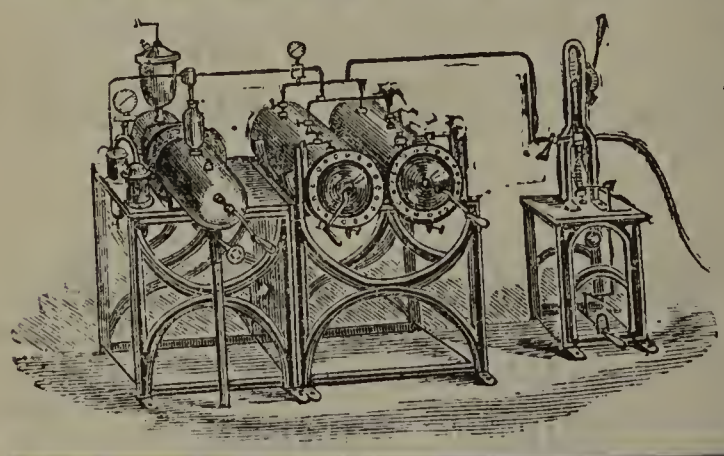

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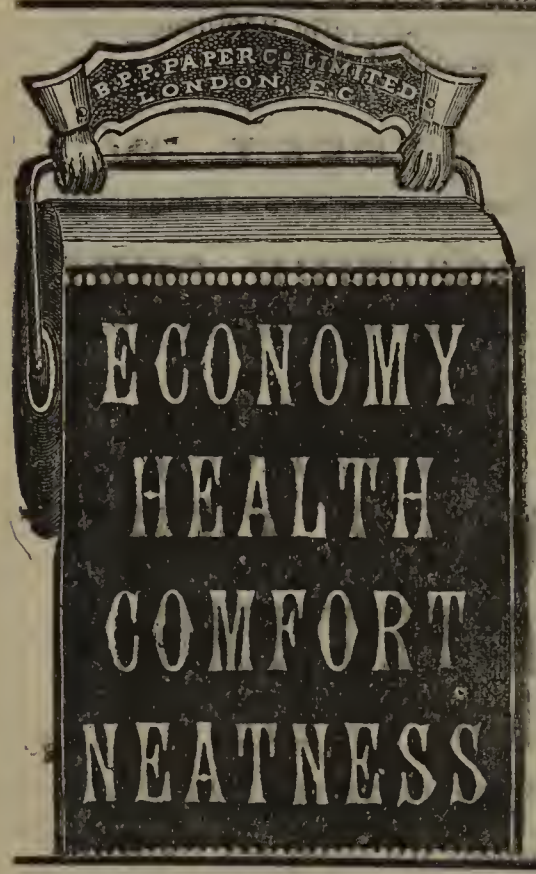

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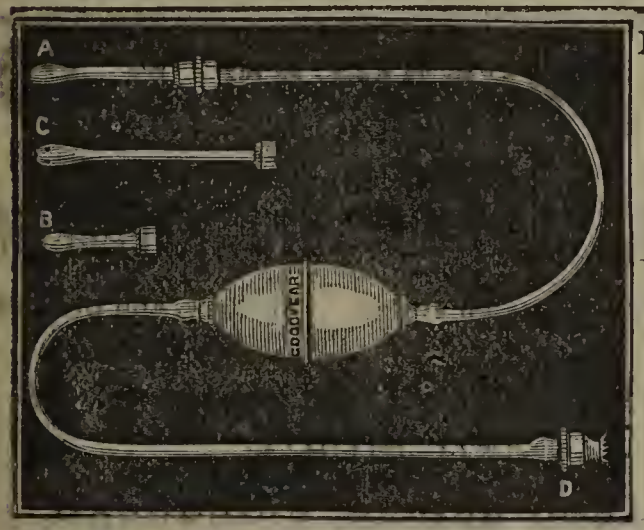

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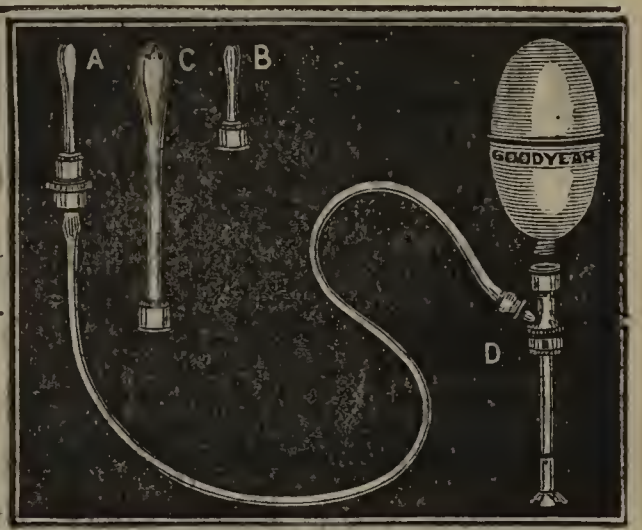

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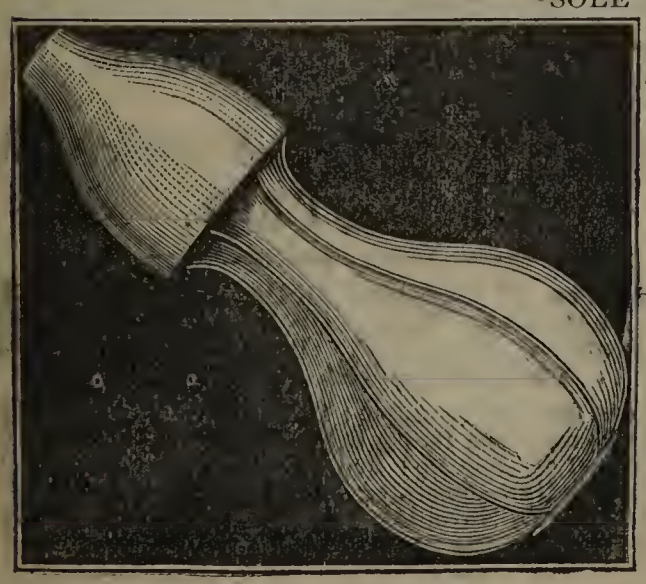

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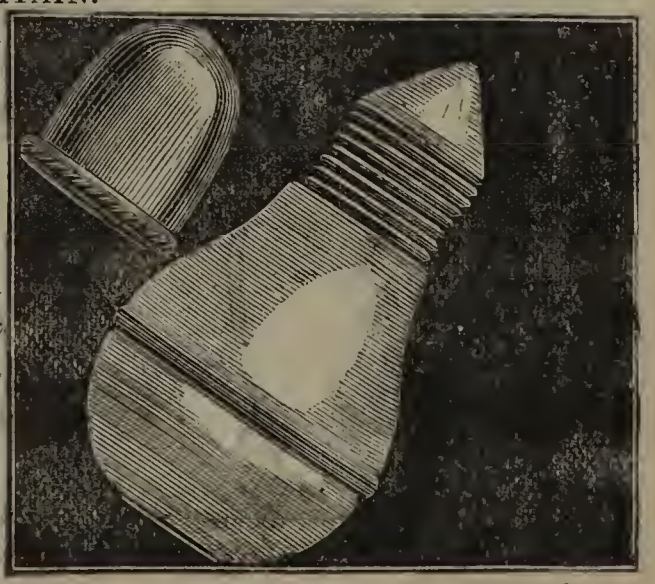

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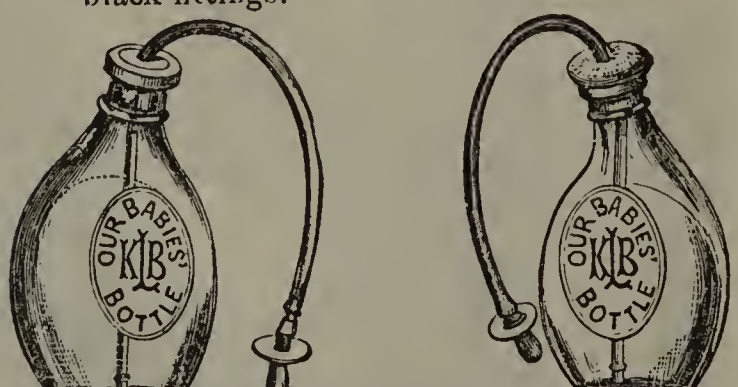

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The MEMORANDUM of the LOCAL GOVERNMENT BOARD, July 13, 1883.

"*If any taint (however small) of infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of propagating disease.*"

The DAILY NEWS, July 19, 1883, says:

"*London is still supplied with drinking water from open streams exposed to choleraic infection.*"

ST. JAMES'S GAZETTE, Nov. 15, 1883

"*THE RECENT OUTBREAK OF DIPHTHERIA AT CANTERBURY.—An investigation by the sanitary inspector has revealed the fact that there are upwards of sixty polluted wells in the district in which the cases of disease occurred. In every instance the water was contaminated with sewage and swarmed with living organisms.*"

The LANCET says, June 30, 1883:

"*Water is the great carrier of the infective germs. It is the water to which we must look.*"

LANCET, September 15, 1883.

"*All parts of the Thames are polluted with human sewage. The whole Thames, in fact, is at all times polluted with unoxidised sewage matters.*"

REPORTS of the LOCAL GOVERNMENT BOARD.

"*Of 142 epidemics of typhoid fever observed in various localities, in 125 cases the epidemic had no other determining cause than the use of water containing impurities.*"

APOLLINARIS NATURAL MINERAL WATER

"THE QUEEN OF TABLE WATERS."

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SPIRITUS ÆTHERIS NITROSI: COMPOSITION IN RELATION TO DETERIORATION.*

BY PETER MACEWAN.

"What this spirit is," says Professor Redwood,† "has hitherto eluded investigations; it contains nitrite of ethyl, aldehyde, and probably other compounds, but in what proportion it is extremely difficult to indicate, all that we can say is that it always contains the same proportion of the same ingredients."

Recognizing fully the difficulty here alluded to, it is with some hesitancy that I approach the subject, for though Professor Redwood made this statement about six years ago little has been done to increase our knowledge of the complex mixture, spiritus ætheris nitrosi. True, pharmaceutical literature published since then shows that it does not "always contain the same proportion of the same ingredients," and the reason why was very clearly shown in the discussion which followed Mr. Abraham's paper at the Southport meeting of the Pharmaceutical Conference. This paper is not intended to add to our knowledge of the composition; I can only consider it as a preliminary statement of the work which I have been enabled to do in the subject. Without entering, therefore, into the question of the "other compounds," I meanwhile propose to discuss the composition as related to deterioration; that is, the existence in the spirit of ethyl nitrite and aldehyde and the influence they exert in causing deterioration. Taking the official spirit as our standard we find that opinion is fairly agreed as to ethyl nitrite and aldehyde being always present in it. Their presence can very readily be demonstrated, as by the tests which I show you.

Proportion of Ethyl Nitrite in the Spirit.—Were all the nitric acid ordered in the official process reacting with the alcohol *to form only ethyl nitrite* ($C_2H_5NO_2$), we should expect to find somewhat over 6·5 per cent. in the finished spirit; but in practice we find that the theoretical yield is not obtained, and only with extreme care can we obtain a product containing 4 per cent. of ethyl nitrite. There is really no authoritative standard to go upon,—the Pharmacopœia tests being empirical,—but Dr. Dupré, in a paper‡ read before the Society of Public Analysts, stated that spirit containing 3 per cent. of ethyl nitrite fairly represented the B.P. preparation. This percentage is a fair one, and as Dr. Dupré's work has been the "guiding star" of public analysts, we may accept his standard, especially since the experience of practical pharmacists sufficiently justifies it. Mr. Symons having so recently shown (*Pharm. Journ.*, Oct. 13, 1883) the quality of commercial spt. æther. nit., I have not attempted the collection of similar information. It was necessary, however, to determine the amount of ethyl nitrite present as deterioration proceeded, and for this purpose Eykman's method was adopted, others having proved uncertain. It will be seen from the table which I give further on that as high as 3·54 per cent. of ethyl nitrite was found, free nitrous acid not being included in the percentage.

The Aldehyde Content.—Aldehyde has generally been looked upon as an unavoidable contamination, and one of the objects aimed at by Professor Redwood in devising the official process was to minimize the yield of this compound. The percentage of it present in the spirit is variable, and as it is closely associated with ethyl nitrite in deterioration, I shall consider it in the paragraph on *development of acidity.* In the distillate of the Pharmacopœia process I have not found higher than 2 per cent. It may be stated that the method of estimation adopted was that devised by Dr. Thresh,* which is based on the formation of aldehyde resin with excess of caustic soda solution, the coloured solution formed being diluted to the tint of a standard aldehyde resin solution, and compared as in nesslerizing. From 5 to 10 c.c. of the spirit may be used. The method gives fairly constant results, and though they may be approximate, still they are much more constant than those given by Mr. Rimmington's method,† which depends on oxidation of the aldehyde with hydroxyl solution and subsequent titration with standard alkali. The weakness here is that the acidity produced depends on more than aldehyde.

These two bodies, ethyl nitrite and aldehyde, are the leading factors in determining the deterioration of spiritus ætheris nitrosi, another being their solvent, rectified spirit, a mixture of alcohol and water. The decomposition which results in the mixture of these three bodies is attended by at least three marked changes which can be physically and chemically determined:—

1st. Increase of specific gravity.

2nd. Diminution of the volume of ethereal liquid separated by saturated chloride of calcium solution.

3rd. Development of acidity.

The extent of these changes we shall consider in their order.

Increase of Specific Gravity.—In the following table I give results of observations. I. to V. are B.P. spirit made by myself or procured as such. VI. is spirit answering B.P. tests raised to ·850 with water, and VII. is the ·850 of London Pharmacopœia.

	Made.	When examined.	Sp.gr. 50° F.
I.	Not known.	May, 1883.	·848
I.	Not known.	March, 1884.	·853
II.	Not known.	May, 1883.	·852
II.	Not known.	March, 1884.	·8576
III.	Nov., 1883.	March, 1884.	·852
IV.	Received Nov., 1883.	March, 1884.	·8516
V.	Feb. 14, 1884.	Feb. 14, 1884.	·846
,,	,,	Feb. 21, 1884.	·850
,,	,,	March 7, 1884.	·8516
VI.	Feb. 15, 1884.	March 7, 1884.	·8536
VII.	Received Nov., 1883.	Feb. 14, 1884.	·856
,,	,,	March 7, 1884.	·859

Diminution of Separation Volume.—In this I give the result of examination of two specimens of the B.P. spirit kept under different conditions,—α in a well stoppered and almost full bottle, which was opened frequently, and β kept in a badly stoppered bottle, half full, and between the second and third observations the stopper was accidentally left out over a night.

α.			β.		
February 14.	2	p. c.	February 14.	2	p. c.
February 21.	1·75	p. c.	February 18.	1·33	p. c.
March 7.	1·33	p. c.	February 21.	Nil.	

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, March 19, 1884.

† *Pharm. Journ.*, [3], viii., 377.

‡ *Pharm. Journ.*, [3], x., 93.

* *Pharm. Journ.*, [3], ix., 409.

† *Pharm. Journ.*, [3], x., 41.

It will be convenient to reserve remarks on these observations until we consider—

The Development of Acidity.—The free acids existing in the spirit are acetic and nitrous acids. It has been stated that nitric acid is also present, but the ordinary methods for determining the existence of nitric acid in presence of the nitrous, are inapplicable in this case. It is questionable, however, if nitric acid can exist as such in presence of the readily oxidizable constituents of the spirit. I have, therefore, calculated the inorganic acid as nitrous acid (HNO_2).

The free acids were determined volumetrically,* semi-normal solution of soda was used, methyl orange being taken to indicate nitrous acid and phenolphthalein to indicate total acidity. The method is certainly not free from objection, the sources of error being (1) decomposition—that is, further acidity—of the spirit during the estimation, and (2) decomposition of the methyl orange by free nitrous acid. The first error can be limited by rapid manipulation, use of undiluted spirit and a small flask. The second is not so rapid in its action as to preclude indication, and by using the methyl orange externally as well as internally, the error is minimized. In the method we take 10 c.c. of the spirit, which is put into a 50 c.c. flask, in which a drop of phenolphthalein has previously been put, then two or three drops of methyl orange solution are put in. Before the estimation is commenced several spots of methyl orange solution are placed on a white plate, and a glass rod should be at hand. The standard solution is quickly, but carefully dropped into the flask, and as soon as the red colour of the methyl orange begins to fade, the glass rod should be dipped in and brought into contact with a methyl orange spot on the plate. If the spot assume a strong pink colour, we have an indication that the nitrous acid is not quite neutralized, so the addition of standard solution is continued until the methyl orange spot becomes but feebly pink. The volume of standard solution used is noted, and the titration continued until the phenolphthalein indicates alkalinity. The first portion used is calculated for nitrous acid and the second for acetic acid.

In the following table the results of several observations are given in percentages, the proportion of ethyl nitrite and aldehyde (as far as determined) being also given. I. to IV. are B.P. spirit (α and β of the separation paragraph are II. and III.); VII. is B.P. raised to ·850, and the others are the ·850 of Lond. Phar.

	Date or age.	HNO_2.	$HC_2H_3O_2$.	$C_2H_5NO_2$.	C_2H_4O.
I.	May, 1883 .	0·47	1·20	0·87	0·80
I.	March, 1883 .	0·773	0·329	0·095	2·50
II.	One week . .	0·215	0·206	3·54	0·85
,,	Two weeks .	0·257	0·247	—	0 95
,,	Three weeks .	0·274	0·349	3·14	. —
III.	Two days . .	—	—	2·01	0·80
,,	Four days .	0·24	0·216	—	1·14
,,	One week .	0 322	0·246	1·24	2·00
IV.	One month .	0·247	0·411	1·93	1·67
V.	Four months	0·161	0·288	3·53	1·5
VI.	Four months	0·352	0·494	1·64	1·426
VII.	Four months	0·418	0·206	0·92	2·5
VIII.	Four months	0·194	0·247	0·22	0·2
IX.	As received .	0·188	0·42	—	—

* In Mr. Rimmington's method the spirit is unduly exposed to atmospheric influence and the action of water.

Having before us these tabulated results of the effect of deterioration on the specific gravity, separation volume, and acidity of the spirit, we may now discuss the causes of decomposition and deterioration.

Ethyl nitrite, it is well known, is a very volatile fluid, and if the spirit be stored in imperfectly closed bottles, considerable loss will result from evaporation. But this does not account for the specific gravity, for since ethyl nitrite is of greater density than spt. æther. nit., the loss by evaporation would tend to decrease rather than increase the density of the spirit. Although Dr. Dupré has stated (see paper quoted) that the acidity of the official spirit is not due to decomposition of ethyl nitrite, yet all pharmacists who have studied this subject have recognized the text-book statement, that the water contained in the rectified spirit used in the preparation reacts with the ethyl nitrite to form alcohol and nitrous acid. A further change takes place, in which acetic acid is one of the products, and since the aqueous solutions of these acids are supernormal, they will tend to increase the specific gravity, and as ethyl nitrite disappears in their formation, the separation volume necessarily decreases. Independent of the reaction between water and ethyl nitrite another reaction takes place, in which acetic acid is formed. What is this reaction? Oxidation of aldehyde, is a natural reply, and to this oxidation the formation has generally been attributed. But it will be observed from the acidity table that aldehyde is an *increasing* rather than *decreasing factor*, as we should in these circumstances expect. This is particularly observable in the case of III., which decomposed rapidly. Without denying that the formation of acetic acid is due in part to oxidation of aldehyde, it must be admitted that another explanation is required. Rapid decomposition is the result of atmospheric influence, and is analogous to the observed fact that the spirit decomposes much more rapidly in partially filled bottles than in full bottles. This observation leads us to infer that part, at least, of the acetic acid is due to oxidation of ethyl nitrite. This oxidation might be expressed in one formula, in which acetic and nitrous acids are formed:—

$$C_2H_5NO_2 + O_2 = HC_2H_3O_2 + HNO_2.$$

We may also express this in two stages; in the first we have aldehyde and nitrous acid formed:—

$$C_2H_5NO_2 + O = C_2H_4O + HNO_2.$$

In the second the aldehyde is oxidized to acetic acid:—

$$C_2H_4O + O = HC_2H_3O_2.$$

It should be further noted that in spite of the greatest care a little nitrous fumes pass over with the distillate in the course of preparation; this admixture, though minute, is sufficient to act as a nucleus, and hence another cause of decomposition under the best conditions for preservation. The effect of water in influencing decomposition is well seen in the case of VII., which contains additional water. The disappearance of acetic acid in the case of I. is probably due to combination between the ethyl radical and it, acetic ether being formed.

Increase in aldehyde may be due to such a reaction as that expressed in the first stage of the formula given, effected either by direct oxidation or by the action of nitrogen acids upon ethyl compounds. An explanation which is not without interest, though purely suggestive, is that it is due to depolymerization

of paraldehyde. You are aware that Mr. Williams stated at Southport that he had a strong suspicion that sweet spirit of nitre contains paraldehyde, which he says is formed during the ordinary process adopted in making the spirit. Well, assuming that paraldehyde (boiling at 124° C.) is capable of passing over with the distillate between 70° and 80° C., we would expect that the action of nascent nitrous acid would be to resolve it into aldehyde, and hence an increase. I show you some "pure paraldehyde" which has been so treated and you will notice that the pleasant odour of paraldehyde has been replaced by the pungency of aldehyde, and it gives the aldehyde resin reaction, whereas the untreated paraldehyde does not.* If I have the opportunity of making a further communication on this subject, I shall return to this question of the increase of aldehyde.

In conclusion I may be allowed a few remarks on the relation which these results have to everyday pharmacy. I have been partly led to make this communication from the continually reiterated statement that "spt. æther. nit., B.P., is quite unfit for use," and that "the ·850 spirit keeps much better;" the inference being that the latter is the better preparation. If any proof to the contrary is required we have it in Mr. Symons's paper, in which he gives the result of analysis of six samples of the ·350 article, only two of which indicated over 1 per cent. of ethyl nitrite and two were under 0·4 per cent.,—these percentages including free acid. In the course of this paper results of experiments with the ·350 spirit are given, and it will be seen that it is subject to increase of density and acidification,—of course, this spirit never gives a separation. Now, the arguments used against the official spirit are, 1st, that the public will not have it, and 2nd, that its acidity renders it unfit for dispensing. The first argument is certainly serious looking, but a number of pharmacists tell me that they never have kept anything but the official spirit, and their experience is that after a series of explanations to their customers they will have nothing else, which is a very wise decision on the part of the customers. To discard the spirit on account of the second argument is of course absurd, for we are legally required to use only the official spirit in compounding physicians' prescriptions. Practically, however, the objection is merely one of degree. In the common ·850 spirit, the acidity is less, because the ethyl nitrite content is extremely small; if pharmacists, therefore, prefer to keep this spirit on account of a vague idea that it is a "better keeping" one, they assume a very serious responsibility. The proportion of ethyl nitrite in the official spirit might no doubt be judiciously decreased and fixed, but even though it were fixed at 2 per cent., it is evident that the objection would only be lessened and not removed. It is, therefore, left to the pharmacist to control deterioration by careful storage of his stock. Hydrocyanic acid is kept in small phials, so that *it* may not deteriorate; so might we keep spt. æther. nit. in proportionately smaller bottles than at present, with equal care. The shop round need not be of the largest series or nearest the shop window, and stored stock should certainly not be kept in partially filled Winchesters, nor need we lay in a stock which will serve the better part of the solar year.

* On this point see abstract of article by A. P. N. Franchimont, *Journ. Chem. Soc.*, xliv., 453.

For the purposes of this investigation, Messrs. J. F. Macfarlan and Co. have liberally supplied me with spt. æther. nit., B.P., and other material, for which I desire to thank them. My thanks are also due to Mr. Dott for much technical information.

[*The discussion on this and the following paper is printed at p.* 826.]

SPIRIT OF NITROUS ETHER.*

BY D. B. DOTT, F.R.S.E.

In this paper on sweet spirit of nitre I have no intention of taking up the slippery subject of its composition and transformations, which Mr. MacEwan has been bold enough to tackle; but am only desirous of discussing the characters and tests of this important preparation. Before doing so, however, it is necessary to refer briefly to what is known of its composition, in order that we may decide what tests it ought to answer. To fix exactly the composition of sweet spirit of nitre is doubtless a problem beyond the attainments of chemical analysis, but there is no reason why we should not have a better knowledge of its chemistry than we at present possess. We may safely say that ethyl nitrite, acetic aldehyde, nitrous and acetic acids, and ethyl acetate, are normal constituents of spiritus ætheris nitrosi, It has been almost universally recognized that the value of the preparation depends on the presence of the nitrite, though this has been doubted by a few writers. Among these is Mr. Abraham, of Liverpool, who believes the aldehyde to be the active ingredient. According to this view the aldehyde is oxidized to acetic acid, which forms acetates with the alkalies of the blood, whereupon the physiological effects are manifested. If I rightly follow this train of reasoning, it would appear that one may as well swallow a little vinegar as take a dose of sweet spirit of nitre. Not being a pharmacologist, I wrote to Professor Matthew Hay, of Aberdeen, on the matter, and have received from him a very interesting letter, from which I cannot do better than quote a few sentences.

"With regard to aldehyde, I cannot at the present moment recall having seen any notice of its physiogical action. I rather think it has not to any extent been investigated. But although that is probably so, I am fairly certain, judging from its chemical relationship to alcohol and the ethers, that in action it will differ to no great extent from these."

"With regard to the sweet spirit of nitre, my opinion is this, that its most active ingredient ought to be the nitrite of ethyl, which it is believed to contain, to, I think, the extent of 2 per cent. But so far as my observation carries me, nitrite of ethyl is present in very variable quantity in the ordinary spirit of nitrous ether, and is sometimes hardly to be detected at all. The nitrite is very active even in very small quantity; and, I believe that if a preparation of spirit. æth. nit. could be obtained containing a constant proportion of nitrite of ethyl, it would be a great gain to practical pharmacy and to therapeutics. The unreliability of the common forms of it has, I believe, led largely in recent years to its disuse."

"Murrell states that nitroglycerine is powerfully diuretic, and I have shown that nitroglycerine is

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, March 19, 1884.

decomposed into nitrite in blood, hence its physiological action—hence diuresis."

I am glad to have my own opinion confirmed by so eminent an authority. We may, therefore, conclude that the right means of estimating a sample of spirits of nitre is to determine the amount of nitrous ether, or rather, of nitrous acid, which it contains. I am far from denying that the medicinal value of the spirit may be materially enhanced by the aldehyde and acetic ether, but these must be regarded as quite subordinate. Besides, it is difficult to estimate their amount.

Let us now consider, one by one, the tests of the British Pharmacopœia. Firstly, we have the specific gravity, which is given as ·845, at 60° F. This is really only a safeguard against admixture with water, though there is a delusion, still to some extent prevalent, that the ·850 must be a better article than the ·845. Doubtless this has arisen from the fact that nitrous ether has a greater density than rectified spirit. It has therefore been supposed that a preparation rich in nitrous ether will have a high specific gravity, but this is a mistake; for it is easy to prepare a spirit fully up to the Pharmacopœia requirements with a specific gravity even less than ·845. According to our experience a high specific gravity just means so much the more water, and if one fact regarding spirit of nitre has been proved more conclusively than another, it is, that water encourages the decomposition of the ether. Whence it is manifest that the specific gravity ought to be kept as low as possible consistent with the due proportion of ethyl nitrite.

Secondly, "it effervesces feebly or not at all when shaken with a little bicarbonate of potash." Not much can be said against this test, though it is perhaps a little indefinite. It might be better to have a limit fixed to the amount of free acid, the same to be determined by standard alkali—but this is doubtful.

Thirdly, "if it be agitated with twice its volume of saturated solution of chloride of calcium in a closed tube, 2 per cent. of its original volume will separate in the form of nitrous ether and rise to the surface of the mixture." This test has given rise to much controversy. It belongs to the class of inaccurate empirical tests, which are always unsatisfactory, though sometimes tolerable when nothing better can be obtained. Chemists have all recognized that the "ethereal fluid," which separates under the above circumstances, is not ethyl nitrite, but a solution of the same, of variable strength. It is probably just as well that it is so, especially when the testing is performed on a warm summer day. Judging from some estimations which I made by the method subsequently described, this etheric fluid would seem to contain from 50 per cent. to 60 per cent. of nitrous ether. Professor Attfield* says that it contains less than half its bulk of ethyl nitrite. Professor Redwood† is responsible for the generally accepted belief that 2 per cent. of separation indicates 10 per cent. of ether. If made regarding the "ethereal fluid," which actually separates, the statement may be fairly correct, but it is quite untrue if applied to a 10 per cent. solution of ethyl nitrite in spirit. Such a solution will separate more than half its contained ether when agitated with solution of calcium chloride. I have tried many experiments with this test, but it would be superfluous to detail them. Suffice it to say that there are three main factors which determine the amount separated:—

1st. The composition of the spirit.

2nd. The temperature.

3rd. The dimensions of the tube.

Regarding the first of these I would only remark that if the spirit is watery it will give a better result, *cæteris paribus*, than one containing less water. It will readily be understood that with a compound having so low a boiling point, and so high a vapour pressure at ordinary temperatures as nitrous ether, the proportion separated by chloride of calcium solution must be much affected by the second and third of these causes; *e.g.*, 15 c.c. of spiritus ætheris nitrosi at 48° F., shaken up with two vols. solution of calcic chloride at same temp., gave a separation of 0·4 c.c. When the experiment was repeated with the spiritus and chloride solution at the temp. of 68° F., separation of only 0·2 c.c. was obtained. By using a capacious tube in one case, and in another a small tube which the mixture nearly filled, results almost as variable were observed. It may here be noted that the "ethereal fluid" takes some time to separate, the process being seldom complete in less than half an hour. The greatest objection to this test is, however, the well-known fact that a genuine preparation will after a certain time, and while still retaining its medicinal virtues, fail to give any separated "ether" when agitated with solution of chloride of calcium. Taking all the facts into consideration, I am clearly of opinion that this separation test ought to be abolished.

What we require is a test which shall show at least approximately the value of the preparation, by means of reagents and apparatus at the disposal of every pharmacist. This must be done by estimating the nitrous acid, whether it exists as such or potentially. There does not appear to be any reason for making a separate determination of the percentage of uncombined nitrous acid, which no doubt contributes its share to the physiological action of the substance. Of the many methods which have been proposed for the purpose of this estimation, probably the best is that devised by Professor Eykman, of Tokio. Not that I regard his process as perfect, because I believe it gives results distinctly under the truth, and of course it includes the nitric acid should any be present. The fatal objection to Eykman's process as a pharmacopœial test is the elaborate apparatus and nicety of manipulation required. It is, in short, better adapted for the laboratory of the analyst than for the pharmacy; and as all the official tests ought to be as simple as possible, we must endeavour to find an easier method. I have tried a great number of experiments with this object, and have to confess that the result after all is not a complete success. The old method of saponifying with caustic soda, and after evaporation of the alcohol, titrating with permanganate, was found to yield very variable results. This is not surprising considering the facility with which potassic permanganate is reduced, and the certainty that there are organic compounds present after evaporation even to dryness. Oxidation of ferrous sulphate was next tried, but from the difficulty of estimating the excess of ferrous salt in the presence of alcohol, and from other causes, the process proved abortive. Volumetric solution of urea was then

* *Pharm. Journ.*, [3], viii., 378.

† *Pharm. Journ.*, [2], viii., 508.

employed, iodized starch solution being used to indicate the end of the reaction, but this plan proved entirely unsuccessful, chiefly on account of the impossibility of observing a definite end-point. Possibly, however, the urea method might be made available by measuring the N, or weighing the CO_2 evolved; that is to say if the reaction goes as it ought. $CON_2H_4 + 2HNO_2 = CO_2 + N_4 + 3H_2O$.

The nitrous ether might possibly be estimated by reduction with hydric sulphide, but I have not had time to thoroughly examine this reaction. The few experiments I have been able to perform with it did not yield promising results.

After innumerable experiments I have been compelled to return to the method which suggested itself to me first of all, viz., the liberation of iodine from potassic iodide, and titration of the iodine with sodium thiosulphate. The only mention I have seen of the use of potassium iodide as a means of estimating spiritus ætheris nitrosi, is reported in the *Pharmaceutical Journal*.* In the discussion after the reading of Dr. Dupré's paper, Mr. Hehner suggested the use of iodide of potassium added directly, with addition of acetic acid, which was thought a good idea. The process is so obvious, that it has probably often been tried and abandoned, which would not be surprising, as without particular precautions it yields results which have no resemblance to the truth. In endeavouring to put this test into practical form, I very soon found that the only way of arriving at right results was to work with a solution of ethyl nitrite of known strength; at least in the first place. We therefore purified some of the nitrite by a method similar to that described by Mr. Williams.† At 60° F. it had a specific gravity of ·901 (or thereby). Mr. Willliams gives the gravity as ·937, but states no temperature. At all events, though it was not analysed, I am confident that it must have been very nearly pure. Ten c.c. were diluted to 100 c.c. with "absolute" alcohol, and this solution was used in the following experiments.

(1). 5 c.c. = 0·45 gram $C_2H_5NO_2$ added to an aqueous solution of 20 grs. potassium iodide, 1 drm. dilute sulphuric acid then mixed therewith, and after half an hour standard thiosulphate run in. Required 28·0 c.c. = 0·21 gram $C_2H_5NO_2$. This low result was caused by loss of ether, which is thrown to the surface of the saline solution. It is hence evident that some solvent must be used to retain the ether.

(2). In this case the same quantities were used, but before the addition of the ethereal solution, 1 fl. oz. rectified spirit was mixed in. The solution was allowed to stand ten minutes before running in the thiosulphate. Required 113·5 c.c. = 0·851 gram $C_2H_5NO_2$. This high indication was caused by the nitric oxide which must be completely removed before the titration. It is essential that the NO be got rid of not only from the alcoholic solution but also from the atmosphere in the containing vessel, as otherwise by uniting with the oxygen to form higher oxides, and these in turn reacting with the water to form nitrous acid, an additional quantity of iodine is liberated. Using the same proportions as just mentioned, but employing a large flask and diligently agitating during the addition of the thiosulphate solution, nearly 300 c.c. were used before decolorizing.

(3). In this experiment the same quantities were used as in (2) but acetic acid instead of sulphuric, the solution being allowed to stand one hour. Required of thiosulphate 21·6 c.c. = 0·162 gram $C_2H_5NO_2$, which is far too low. Acetic acid, as suggested by Hehner, will, therefore, not do.

(4). Several experiments were tried, passing carbonic anhydride into the test solution contained in a flask. The gas was passed in before addition of the acid, and the stream continued until the completion of the titration. In other cases the CO_2 was passed only into the air space above the liquid. In all these instances the results obtained were too low and very variable, possibly on account of the gas carrying away some of the ether.

It would be tedious to describe the different devices that have been tried, to ensure, if possible, an accurate result. Suffice it to say, that as an inference from numerous experiments, the following method was adopted as the best:—Let 1 gram of iodide of potassium be dissolved in 10 c.c. of water. Then add 20 c.c. of rectified spirit, and to the solution so obtained add 5 c.c. of the spirit to be tested. Now pour in 5 c.c. dilute sulphuric acid, and allow to stand for an hour, then titrate with standard thiosulphate.

The operation is best conducted in an eight ounce porcelain basin. The following are some of the results obtained:—

(5 c.c. used in each case.)	$\frac{1}{10}$ $Na_2S_2O_3$ solution.		$EtNO_2$ grams.	$EtNO_2$ (vol.) per cent.
(*a*.) 10 per cent. (vol.) soultion in alcohol . .	59·5 c.c.	=	·446	= 9·91
(*a*.) 10 per cent. (vol.) solution in alcohol . .	59.8 c.c.	=	·448	= 9·96
(*a*.) 10 per cent. (vol.) solution in alcohol . .	60·0 c.c.	=	·450	= 10·00
(*b*.) Sple. sp. æth. nit. (recent).	26·5 c.c.	=	·198	= 4·41
(*b*.) Sple. sp. æth. nit. (recent).	26·8 c.c.	=	·201	= 4·46
(*c*.) Sple. sp. æth. nit. (four months)	23·5 c.c.	=	·176	= 3·91
(*c*.) Sple. sp. æth. nit. (four months) . . .	24·0 c.c.	=	·180	= 4·00

Although formerly indicated, it may again be noted that the total nitrous acid is given as ethyl nitrite. The older sample contained much more free acid than the fresh one. The method employed is evidently only approximate, but it may serve until something better is devised. It has, at any rate, the advantage of requiring only such apparatus and reagents as are in common use.

Before concluding, I would venture to express a hope that the compilers of the next Pharmacopœia will fix a fair standard of purity for spirit of nitrous ether, so that no departure therefrom will be allowed. We sometimes hear the fallacy propounded, that an inferior preparation must be excused, because, at some time or other, it has been produced by the official process. This is an entire mistake. Not only must the official process be followed, but it must be so conducted as to produce a right result, and the product must be so preserved as to be of proper strength when required for use. Yet, as the Pharmacopœia requires of pharmacists preparations of a certain degree of purity, so pharmacists require of the Pharmacopœia processes and tests which are reasonable.

* [3], x., 93.
† *Pharm. Journ.*, [3], viii., 442.

THAPSIA RESIN.*

BY F. CANZONERI.

The root of *Thapsia Garganica*, a plant known for its vesicating properties, yields to boiling alcohol a white amorphous waxy substance, slightly soluble in ether and carbon bisulphide, and melting, after purification, at 90°. This substance, however, forms but a small part of the thapsia root. More abundant and important constituents are obtained by treating the dried and chopped root in a percolator with ether, whereby a yellow solution is obtained, which, on distilling off the ether, yields an amber-coloured syrupy resin possessing strong vesicating properties. This acid dissolves in strong aqueous potash at ordinary temperatures and in dilute potash when heated—in both cases with great rise of temperature,—and on neutralizing the resulting solution with hydrochloric acid, a yellow curdy precipitate is formed, having an unpleasant odour, and consisting of a mixture of liquid and solid ethers and fatty acids, together with resinous substances. From this mixture of products, the author has obtained: (1.) An octoic or caprylic acid, $C_8H_{16}O_2$; (2) a new acid of the series $C_nH_{2n-2}O_4$, which he designates as thapsic acid; (3) a non-azotized neutral vesicating substance.

This last constituent was obtained in very small quantity only, and in some preparations was altogether absent; it is moreover very difficult to purify from resinous substances and wax, by which it is generally accompanied. It dissolves in hot alcohol, and separates on cooling in shining needles melting at 87°; also in ether and in carbon bisulphide; all its solutions possess vesicating properties. Heated with strong potash-lye, it dissolves partially and is precipitated in the crystalline state on diluting the solution with water. It is not altered by boiling with strong acids. Heated on platinum foil, it burns away without residue, emitting a pleasant odour.

Thapsic acid, $C_{16}H_{30}O_4$, is obtained by pressing between paper the curdy precipitate formed on adding hydrochloric acid to the solution of the resin in aqueous potash, and crystallizing it several times from boiling alcohol with addition of animal charcoal. It forms white shining scales melting at 123° to 124°, nearly insoluble in water, benzene, and carbon bisulphide, soluble in alcohol, less soluble in ether. When strongly heated, it distils without alteration; ignited on platinum foil, it burns with an odour of burnt wax. It is but slowly attacked by bromine or by strong nitric acid. It is a bibasic acid. Its *potassium salt*, $C_{16}H_{28}O_4K_2$, forms shining anhydrous prisms. The *barium salt*, $C_{16}H_{28}O_4Ba$, obtained by precipitation from the potassium salt, is a white amorphous powder insoluble in water and very slightly soluble in boiling alcohol. The *silver salt*, $C_{16}H_{28}O_4Ag_2$, is a white insoluble precipitate which blackens when heated or exposed to light.

Thapsic acid dissolves at boiling heat in aqueous ammonia, and the solution on cooling deposits a crystalline substance probably consisting of the corresponding amide. The acid heated with aniline at 170° to 180° in sealed tubes, is converted into the anilide,

$$C_{16}H_{28}O_2(NHPhen)_2,$$

which forms a white crystalline powder melting at 162° to 163°, and acquiring a faint violet colour when exposed to the air.

The barium salt of thapsic acid distilled at a moderate heat with excess of barium hydroxide, yields a small quantity of hydrocarbons, saturated and non-saturated, having a musky odour, combining for the greater part with bromine, and forming a solid body which, when dried between bibulous paper and crystallized from alcohol, forms white needles melting at 73°.

* From the *Gazzetta*, xiii., 514-521. Reprinted from the *Journal of the Chemical Society*, April, 1884.

Octoic or Caprylic Acid, $C_8H_{16}O_2$.—On distilling with steam the oily precipitate obtained by neutralizing with hydrochloric acid the potash-solution of the ethereal extract of the resin, after removal of potassium thapsate and dilution with water, there passes over a yellow transparent oil, lighter than water. On exhausting this oil with ether, drying the etheric solution with calcium chloride and distilling, the greater part goes over at 220° to 236°; and on fractioning this portion at intervals of 5°, three other fractions are obtained, the most abundant of which is a colourless liquid soluble in alcohol and ether, and solidifying when cooled with snow, in flexible laminæ melting at ordinary temperatures. The product thus obtained is shown by analysis to have the composition of an octoic acid, and in its melting and boiling points it agrees nearly with the octoic acid obtained by saponification of cocoanut oil, and by oxidation of the octyl alcohol from heracleum oil, melting at 16°, boiling at 236° to 237°, which agreement the author has further confirmed by examination of the sodium, barium and zinc salts.*

The author suggests that thapsic acid may be a *dioctoic acid*, $C_8H_{15}O_2.C_8H_{15}O_2 = 2C_8H_{16}O_2 - H_2$, formed from the octoic acid by slow oxidation in the body of the plant.

SPARTEINE.†

BY O. BERNHEIMER.

This base, $C_{15}H_{26}N_2$, was first obtained from *Spartium scoparium* by Stenhouse in 1881, who determined its composition, and was afterwards examined by Mills, who showed that it is a tertiary diamine. The sparteine examined by the author was prepared from *Spartium scoparium* by a slight modification of Stenhouse's method; it distilled to the last drop at 180-181° under a pressure of 20 mm. Its solution in alcohol at 96° has a specific rotatory power $[\alpha]_D = -14{\cdot}6$ for a concentration of 23·88 at 26°. It bears a heat of 200° without alteration, but becomes partially carbonized at higher temperatures; is not decomposed by heating in sealed tubes with hydrochloric acid. Bromine acts strongly on sparteine at ordinary temperatures, even when it is largely diluted with ether forming an undefined resinous mass.

On gradually adding 3 parts iodine dissolved in ether to an etheric solution of 1 part sparteine, the iodine is decolorized, and a black precipitate is formed, which when separated, washed with ether to remove free iodine, and dissolved in boiling alcohol, separates on cooling in beautiful green needles, having the composition $C_{15}H_{26}N_2I_3$. This compound is insoluble in cold water and alcohol, but dissolves readily in those liquids when heated; it is insoluble in ether, permanent in the air, and yields free sparteine when heated with potash.

Sparteine (as sulphate) oxidized with potassium permanganate yields a small quantity of a volatile acid, having the odour of the fatty acids, together with non-volatile acid having the composition of a *pyridinemonocarboxylic acid*, $C_5H_4N.COOH$; and on distilling a salt of this acid with lime, a volatile base is obtained having all the properties of pyridine. The author intends to continue his experiments as soon as he is in possession of a larger quantity of material.

* The author, in accordance with the view hitherto generally entertained, regards this acid as normal octoic acid, $CH_3(CH_2)_6COOH$, but recent investigations have shown that the primary octyl alcohol of heracleum oil is an iso-alcohol, $CHMe_2(CH_2)_4.CH_2OH$, and consequently that the acid obtained from it by oxidation must be an iso-acid, $CHMe_2(CH_2)_4.COOH$. (See Watts's 'Dictionary of Chemistry,' viii., 379.)

† Preliminary notice. From *Gazzetta*, xiii., 451–454. Reprinted from the *Journal of the Chemical Society*, March, 1884.

The Pharmaceutical Journal.

SATURDAY, APRIL 12, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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PETER SQUIRE.

WHEN Death comes to some men to whom it is given to serve their fellows he overtakes them still busy, with their work uncompleted; others having finished their labour are found so entirely forgotten in their retirement that the news that they have passed away hardly excites more surprise than the discovery that they were alive so recently. But it was not so with PETER SQUIRE, whose death it is our painful duty to record this week. Although bearing the ripe burden of eighty-six years when he died, his name is still familiar as a household word among pharmacists, through the admirable *vade mecum* which he placed at their disposal and which he continued to supervise almost to the last, whilst three years have not elapsed since he took part in the discussions at the Fifth International Pharmaceutical Congress, of which he was elected a Vice-President, and contributed an able paper upon a subject that he had made his own, the equalization of the strength of preparations of potent drugs in the different pharmacopœias. Indeed it is difficult to realize that one who was so recently a real living influence among us could have been the colleague and contemporary of men who have receded so far into the past as WILLIAM ALLEN, RICHARD BATTLEY, JACOB BELL, CHARLES DINNEFORD, DANIEL BELL HANBURY, WILLIAM INCE, THOMAS MORSON, CHARLES JAMES PAYNE, JONATHAN PEREIRA, JOHN SAVORY, and many others that might be named. Keen of intellect, vigorous of habit, indefatigable in work, pungent in speech, a thoroughly capable business man and yet a pharmacist who has left his mark on both the practical and scientific aspects of his calling, PETER SQUIRE was a man of whom British pharmacists may well be proud; for it can hardly be hoped that they will more than occasionally be able to boast of men who are his equals.

Like many men who prove themselves eminently capable of looking after their own interest, and probably because they are so, Mr. SQUIRE found time to render signal services to others. As early as the year 1841 he joined in the struggle to place pharmacy on a proper footing in this country, having been a member of the sub-committee entrusted with the task of opposing the progress of the Bill of Mr. HAWES in Parliament, and which eventually drew up the proposition for the perpetuation of the temporary organization in the interests of chemists and druggists that resulted in the formation of the Pharmaceutical Society of Great Britain. As a member of this Committee, Mr. SQUIRE became a member of the Council of the newly-fledged Society. Afterwards when it was determined to carry out that part of the programme which associated examination with membership, and other bodies to which the Council was at first disposed to look for help in this direction declined to render it, his colleagues found in him an invaluable organizer of the first Board of Examiners. During twenty-seven years he was himself an active member of that Board, and when he retired from it in 1869 his colleagues placed on record their high appreciation of his valuable services in an address which they presented to him. Meanwhile he had been chosen in 1849 to preside over the Society he had assisted in forming, an honour that was repeated in 1861 and and in 1862, and during this latter term of office he took an active part in conjunction with the Secretary, Mr. ELIAS BREMRIDGE, in securing the insertion in a Juries Bill before Parliament of a provision for the exemption of pharmaceutical chemists from service. Mr. SQUIRE continued a member of the Council until 1870, when he declined further nomination, having helped to conduct the affairs of the Society during nearly thirty years.

Mr. SQUIRE's services to pharmacy were, however, by no means confined to the business of the Pharmaceutical Society. His studies of the juices of plants had already before its formation practically rewritten the formulæ for extracts, and his success as a practical pharmacist had won for him the appointment of Chemist to the Queen. Much other valuable work, more or less scientific, was done by him, but perhaps some of the most lasting in its influence was that connected with compilation and publication in 1851 of the comparison of the three Pharmacopœias then official in the three kingdoms, which paved the way for and rendered inevitable the British Pharmacopœia. Other publications of Mr. SQUIRE are too well known to mention here, and, probably whilst adding to his reputation they yielded him satisfactory returns of another kind. Throughout his life, from boyhood to old age, PETER SQUIRE was active, persevering, industrious, and self-reliant. Whilst some of his characteristics were too marked to allow him always to escape criticism, yet if his opponents had survived instead of preceded him, as most of them have done, they would have been among the first to proclaim that in PETER SQUIRE pharmacy has lost a sterling man.

ALCOHOLIC FERMENTS.

THE capability of saccharine juices obtained by expression from fruits, such as grapes and apples, to undergo the change now known as alcoholic fermentation was evidently familiar to the human race in

the earliest historic periods, but it has been only in recent years that clear glimpses have been obtained of the nature of the phenomena involved. Even now, although it is generally well understood that alcoholic fermentation is a physiological function of certain species of fungi, there remains considerable obscurity about the life history of these organisms. The presence on the surface of ripe fruit of germs capable of inducing fermentation in the juice of the fruit was first demonstrated by M. PASTEUR, but even this able investigator was obliged to leave the source of the germs unexplained. Different observers have shown that these particular kinds of germs are frequently present suspended in atmospheric air, but not in sufficient quantity to explain the abundance in which they occur on the surface of fruits. Moreover, M. PASTEUR noticed that the germs are not found on the skin of the grape until it ripens, so that it is only during a comparatively short portion of the exposure of the fruit to atmospheric influences that the skin becomes coated with the fermentative particles. It is evident, therefore, that in order to understand the manner in which the ferment is perpetuated from one vintage to another, some clue as its habitats at different periods of the year was necessary, and an important contribution towards the elucidation of this point was made two or three years since by a Danish botanist, Dr. HANSEN, in the observation that the soil is the winter resting-place of the spores of *Saccharomyces apiculatus*. Following up this line of investigation a French worker, M. BOUTROUX, has discovered other natural habitats of the alcoholic ferments in flowers and insects, but for the most part the species of ferments observed were new ones. Although the interesting account of his work which has been recently published in the *Annales des Sciences Naturelles* cannot be said by any means to have settled the question as to the hibernation of the most important of the ferments, it is suggestive of a field of research that is at present almost unexplored.

The course of investigation adopted by M. BOUTROUX was to test various substances as to whether they were acting as carriers of ferment germs by placing them in a previously sterilized fermentescible liquid, under conditions favourable to fermentation. If any evolution of gas resulted the organisms present were examined under the microscope, and in the event of any being detected that appeared to be alcoholic ferments they were isolated by successive cultivations in media favourable to their propagation and unfavourable to the development of other organisms by which they might be accompanied. A slightly acid medium was found preferable as preventing the development of bacteria; grape must proved extremely suitable, as might be expected, and cherry juice diluted with water was also used successfully. In this way the experimenter determined the presence of alcoholic ferment germs in the nectaries of a considerable number of flowers; they were found at all times of the year, being simply less numerous in winter than in summer, and the conclusion arrived at was that the occurrence of such germs upon flowers is not accidental, but a normal condition. Thus even in winter the germs were present on such flowers as *Petasites vulgaris* and *Erica mediterranea*, and as the weather became warmer the number of ferment-bearing flowers increased, so that in May, every single flower of a plant much frequented by bees, like borage, proved capable of setting up alcoholic fermentation in cherry juice. That the presence of these germs on the flowers was not due to accidental deposition from the atmosphere was inferred from the fact that unripe fruits, taken at the same time from the same plants as the active flowers, were incapable of setting up alcoholic fermentation, whilst even ripe fruits appeared very variable in their behaviour. In fact, a point affecting the presence of ferment germs more than the maturity of the fruit is the condition, for whilst perfectly sound ripe fruits, even grapes, seemed to be practically devoid of germs, the slightest insect puncture or other damage was found coincident with a comparative abundance of them. The question therefore arose whether any connection could be traced between insects as germ carriers and the plants they visited as germ bearers. A number of insects, including bees, wasps, flies, and some small coleoptera, were therefore subjected to a treatment similar to that applied to the flowers. The result was to show that as a rule the ferment germs were more numerous upon the bodies of the insects than upon fruits or even flowers, and it was thought that this fact tended to show that the ferment germs are sown upon fruit by insects who bring them either from other fruits or from flowers that they visit. To prove this theory it was necessary to show that the ferments found upon the insects were of the same kind as those occurring on the flowers; but before this could be done, it was necessary to isolate and define the growths of the different species of *Saccharomyces*, the result being that no less than nineteen kinds of growths were found, presenting different characters and possibly representing different species, but all capable of provoking alcoholic fermentation in saccharine liquids. In connection with this long and tedious portion of the investigation many interesting observations were made, but it must suffice to mention here that it was found that the nineteen kinds were divisible into two groups,—fifteen of them being capable of provoking alcoholic fermentation in a solution of cane sugar as well as of glucose, and therefore called "inversive," while four were capable of provoking it only in solution of sugar already inverted, and were therefore termed "non-inversive."

Having thus prepared the way for ascertaining the relations existing between the ferment germs found in different situations, M. BOUTROUX proceeded with his observations in this direction, but it must

be confessed that the results, so far as they are recorded, are far from being decisive. A tabular analysis shows that flowers yielded four inversive and two non-inversive varieties, four of which, two inversive and two non-inversive, were also obtained from immature fruits. Intact ripe fruits yielded no inversive germs, but only the same two non-inversive varieties that were obtained from flowers and green fruits. In damaged ripe fruits, however, one of these disappeared and in its place was another non-inversive ferment, *Saccharomyces apiculatus*, not observed on other fruits or flowers. From insects all the kinds previously referred to were obtained, and therefore the connection between flowers, fruits and insects as alcoholic germ carriers appears to be so far established. But, unfortunately, none of the ferments actually discovered was of primary importance in regard to those cases in which fermentation is carried out economically, and therefore no connection was established between the germs found on flowers and insects and the organisms that are characteristic of the wine, beer, or cider fermentations. The possibility is not excluded that the explanation of this may lie in some of the forms treated as different by M. Boutroux being really modifications of the same organism induced by surrounding conditions; though it is candidly admitted that no tendency to such modification was noticed during the experiments. It may be, that the failure to find these economic germs on flowers or insects is due to their extreme rarity, for there appears to be no relation between their ordinary number and their abundance when they find a favourable *nidus* for their development. Thus in a sample of grape must, in which the *Saccharomyces ellipsoideus* was so rare as not to be detected immediately after the crushing of the fruit, it multiplied so rapidly that in two or three hours it was plentiful and very soon crowded out all the other ferments that were originally present. Notwithstanding, however, the apparently imperfect evidence, M. Boutroux feels that his results warrant him in putting forward a theory respecting the manner in which the alcoholic ferments are preserved from year to year. In the autumn the germs occur everywhere on ripe damaged fruits, where they multiply rapidly. After the fruit season, they are preserved partly, as shown by M. Pasteur and M. Chamberland, on the surviving *débris* of the fruit, and partly, as shown by Dr. Hansen, in the earth, and thus they pass through the winter. At the commencement of the spring, or even earlier, the germs still surviving are borne by insects to the nectaries of flowers, where they multiply to a certain extent, and during the summer they are cultivated in a succession of flower-nectaries, thanks to the incessant re-sowing carried on through the same agency. Then, in the autumn they are transported by the untiring carriers to the ripe fruit, and the cycle is complete.

We are requested to say that, in consequence of the examinations occurring during the present week in the Society's rooms in Edinburgh, it was found impracticable to hold the Evening Meeting of the North British Branch announced for the 9th inst. It is thought probable, too, that in the following weeks the Tercentenary University festivities would constitute a disturbing influence. It has, therefore, been decided to abandon the meeting, and Dr. Macfarlane has promised to read his paper in the course of next session.

* * *

It is satisfactory to find, from a letter on another page, that the decision of the Council to acquire more important premises in Edinburgh for the housing of the North British Branch is appreciated so far north as Aberdeen. It is hardly for us to decide whether the suggestion made by our correspondent as to the furnishing of the new premises is worthy of carrying out; but we may venture to say that a still better way would be for every Scotch member or associate who desires to show his approval of the liberal policy of the Council to take every opportunity to promote the fuller representation of the Society in the North.

* * *

A circular has been issued stating that pending the rebuilding of the works of Messrs. Powers and Weightman, of Philadelphia, destroyed in the late disastrous fire, an arrangement has been made with Mr. Böhringer by this firm for the manufacture of their quinine in Europe. It appears, however, to be thought not unlikely that, in view of the disadvantages attending the home manufacture of quinine in the United States since the abolition of the import duty, this arrangement may have a somewhat more permanent character than is conveyed in the announcement.

* * *

We have received a copy of the Twenty-Seventh Annual Report presented at the meeting of the Pharmaceutical Society of Victoria on the 12th ult., from which we learn that the progress of the Society during the past year was, in all respects, satisfactory. Allusion is made to the proposal to hold a conference of pharmacists representing the different Australian colonies, which, however, was not carried out in consequence of the refusal of the Pharmaceutical Society of New South Wales to participate in it at present. Another subject prominently alluded to in the Report is the formation of a Chemists' Assistants' Association, having for its object the shortening of the hours of labour. A general meeting of chemists and druggists was called and the proposal put forward by this Association was that shops should be closed on week-day evenings from Monday to Friday at nine o'clock, and on Saturday at ten. This was not accepted by all the employers, and, indeed, was not unanimously supported by the assistants; consequently no general agreement was arrived at. But we are glad to notice that the question is being more satisfactorily dealt with in some districts. The School of Pharmacy is said to have shown a large increase of students, some of whom came from the other colonies. The finances also seem to be in a good condition, the least satisfactory feature in the balance sheet being a considerable loss entailed in the supply of a journal to the members of the Society.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

(*Concluded from p.* 790.)

The next papers read were on—

SPIRITUS ÆTHERIS NITROSI: COMPOSITION IN RELATION TO DETERIORATION.

BY PETER MACEWAN,

and

SPIRIT OF NITROUS ETHER: ITS CHARACTERS AND TESTS.

BY D. B. DOTT, F.R.S.E.

The papers are printed on pp. 817 and 819, and gave rise to the following discussion:—

Dr. Inglis Clark proposed a vote of thanks to the authors of these papers, and remarked that it was not possible for him to enter into any detailed criticism without the text of the papers before him. Mr. MacEwan had mentioned that acetic acid had decreased, and probably had entered into combination. The decrease was only noted in one specimen, and if it had gone to form acetic ether he would expect that the separation volume would increase rather than diminish. Probably, therefore, the acid had evaporated. Regarding the increase in specific gravity, he thought that this might be the result of contraction caused by loss of the more volatile constituents. Mr. Dott's assay process seemed to give fair results, and its simplicity was in its favour. The high results which he obtained contrasted very markedly with those given by Mr. MacEwan, being over 7 per cent. in the one case and 3·5 per cent. in the other; he would infer from that either that Mr. Dott's specimen was exceedingly good, or that one of the processes was bad. He had listened to the papers with pleasure, and he considered them able contributions to the literature of the subject.

Mr. Gilmour said that he had always considered the official tests unsatisfactory, and he was glad that the papers read were directed to show why that was so. He hoped that better tests would be adopted in the next pharmacopœia. The opinion that the ·850 spirit was better than the official one was pretty widely spread, and it would take a great deal to convince many people that it was not; but it had been very clearly shown that any superior properties which it possessed were due rather to weakness in the proportion of nitrous ether than to superior method of preparation. Mr. Dott's method was very simple and he hoped to give it a good trial after the paper was published.

Mr. MacEwan said that the sample in which acetic acid had decreased so much was at least a year old, and ten months had elapsed between the two estimations. He thought that prolonged contact between the acetic acid and alcohol or other ethyl compound would tend to cause formation of acetic ether. The quantity of this sample at his disposal was not sufficient for the separation test at the time of the second examination, but it gave no separation when first examined. If the method proposed by Mr. Dott gave constant results, or nearly so, he would say that no little difficulty had been overcome, for the continued action of the nitrous fumes on the potassium iodide in the initial stage and during titration seemed an insurmountable difficulty, and had caused him to abandon the process. Judging from the results which Mr. Dott had got with a standard solution of ethyl nitrite he thought that the method promised well. The difference between Mr. Dott's percentages and his own was certainly remarkable, but then the specimens were different. He had used Eykman's process and had taken it upon its merits, for it gave constant results, and this could not be said of any method previously suggested. He had of course deducted from the percentage of ethyl nitrite found by that process the amount of nitrous acid previously determined.

Mr. Dott said he did not say that the method suggested was absolutely correct, but he thought that it gave approximate results, and when thoroughly tried it would be found simple. Of course it should not be forgotten that spirit of nitre was not a pure solution of nitrous ether, so that the other compounds present might influence the test.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council was held on Wednesday, the 2nd inst.

Present—The President, Mr. James E. Brunker, M.A., in the chair; Messrs. Allen, J. Evans, Grindley, Hayes, Dr. Montgomery, Sir George Owens, Mr. Simpson, Professor Tichborne and Mr. Wells of Dublin; Mr. Doran, Bray; Dr. Whitaker, and Messrs. Payne and Pring, of Belfast; Mr. McIlwaine, Newry; and Mr. Minchin, Athy.

The President said that since they last met the country had sustained a great loss by the death of the Duke of Albany. As loyal subjects he thought they should express their feeling on the subject, and he would, therefore, request them to allow the standing orders to be suspended in order that a resolution might be moved on the subject.

The standing orders having been suspended,

Sir George Owens moved the following resolution:—

"That this Council desires to place on record its sincere regret at the sudden death of His Royal Highness the Duke of Albany, and hereby expresses its deep sympathy with Her Majesty the Queen and the Duchess of Albany in the great affliction which has befallen them in the removal of one who was so bright an ornament of the State."

Mr. Pring seconded the motion, which was passed unanimously.

Mr. Allen moved, pursuant to notice, that—

"Candidates for the Society's licence shall give satisfactory proof of having attained the age of twenty-one years."

At present the Certificate Committee had not power to demand proof of that description, although they could require proofs from the candidate that he had attended chemical lectures, and spent two years at practical pharmacy. It had been found that one young gentleman had passed the examination for the licence who was not twenty-one years of age.

Mr. Payne said he had great pleasure in seconding the motion. He thought a certificate of birth from the registry office should be required.

Mr. Allen said it might be very difficult to give that particular proof sometimes. It would be quite safe to leave it to the Certificate Committee to decide what was satisfactory proof.

The motion was unanimously agreed to.

The President said the next business was the report of the Pharmacy Act Amendment Committee, which had been printed and was in the hands of every member. The Registrar would read it, and it could be discussed paragraph by paragraph. He (the President) supposed they had all seen the fate of the Bill promoted by the English Pharmaceutical Society—that the Government had declined to take up any portion of it except that relating to the sale of poisons.

Mr. Fennell then read the report. Clause 1 referred to the right preserved by section 31 of the Pharmacy (Ireland) Act to "chemists and druggists" who were practising as such in Ireland upon their own account, to

continue their business, which carried with it the right to sell scheduled poisons; and recommended that power should be given to the Society to require all *bonâ fide* chemists and druggists who had been in business on their own account on or before January 1, 1884, to apply to the Council to have their names registered; such persons to pay on registration a fee of three guineas, and to be styled "Registered Druggists."

Agreed to.

Clause 2 recited that there were small towns and villages in Ireland where a highly educated pharmacist could not earn a livelihood, but where persons of proved intelligence and education as retailers of drugs and poisons for veterinary and household purposes were required, and recommended:—(A.) That the Council of the Society should be given power to hold examinations at stated periods for such persons, who, on passing the prescribed examinations and paying a fee of three guineas, should be entered on the registry of "Registered Druggists." (B.) That such persons should be examined with respect to their knowledge of the English language, arithmetic and elementary chemistry, and should have a practical knowledge of, and be able to distinguish by their appearance and by suitable tests the various drugs and poisons or poisonous substances in general sale. The rules affecting the examinations to be approved of by the Lord Lieutenant in Council.

Mr. Payne moved that clause 2 be omitted altogether from the report. The apothecaries of the past had carried on the compounding of medicines to the satisfaction of the public. The only drawback was that there was not enough of them. They merged into medical practitioners, and the profession of pharmacists was created to meet the want that was found to exist. He objected altogether to the creation of a third grade. The object of the Pharmaceutical Society was to provide a well-educated body of men to take the place of the apothecaries. In the country districts and small towns of Ireland there was not a great deal of compounding to be done, and unless the sale of poisons and poisonous drugs and the compounding of medicines were confined to pharmacists and apothecaries, it would be impossible for either of these to exist in such places. On the other hand, by maintaining that restriction they would give scope for the existence of a class of men who could not otherwise exist in those places. The creation of such a new grade as the recommendation proposed would not only be an injury to pharmaceutical chemists but to the public. It would be far better for the public to have thoroughly educated men everywhere. But if a second grade of registered druggists should be created and perpetuated they would have fifty times more illicit compounding then went on at present. The public would not distinguish between the registered pharmaceutical chemist and the other grades at all.

Mr. Doran seconded the motion. He had a feeling of considerable apprehension as to what the fate of the Society would be if the proposed new grade should be established. It would lead to no end of litigation and to prosecutions, for which the Society would have no funds. It would also prevent young men from coming up for the Society's final examination. Young men had told him that they would not go on for the final examination if the recommendation should become law.

Mr. Grindley said his hostility to the proposal under consideration continued as pronounced as ever it had been. He did not know on what grounds it was asserted that there was a deficiency of pharmaceutical chemists and apothecaries in Ireland. Every quarter that Society passed a certain number of men as pharmaceutical chemists. Country villages were generally supplied with medicines from the dispensaries, the dispensary doctor keeping open shop. It now took four years to make a pharmaceutical chemist, and they should not be like children, first sowing their seed in the ground and then rooting it up to see if it was growing. Let them strive to turn out a class of men who would serve the public satisfactorily and without falling into errors, and who would thus gain their confidence. If they created this grade they would render the practice of the pharmaceutical chemist worth nothing in the country. Instead of doing so they should strive to secure some encouragement for the young men who had passed their final examination. The present recommendation had been persistently put forward by a section of the Council who were beaten on it in 1878 at the Annual Meeting.

Mr. Minchin said he quite agreed with what had been said against the clause. He came from a small town in which it was perfectly true that a qualified man could not live by dispensing alone. An apothecary had this advantage, that he could prescribe for patients. A pharmaceutical chemist could not; he could only make up prescriptions. If the exclusive sale of poisons were taken out of the hands of pharmaceutical chemists they would have every grocer and hardware merchant in the country selling poisons.

Dr. Whitaker said that when the apothecaries of Ireland had the sale of these matters entirely in their hands they were urged to cease being medical men and to devote themselves entirely to the sale of drugs and medicines. They refused to do so, and the result was that the Government took the matter into their own hands and passed the Act under which pharmaceutical chemists existed. The Council ought, therefore, to take care that the public were not left without any accommodation that they required. The late Sir Dominic Corrigan called attention to the fact that in his time Celbridge, Lucan, Leixlip, Kilcock, and another town in the vicinity had not a druggist in one of them. And in places where a pharmaceutical chemist could not exist it was absolutely necessary to provide some means by which the farmers of the surrounding districts could get corrosive sublimate, arsenic, or any other thing of the sort that they wanted. Better that these matters should be supplied by somebody over whom the Society would have control than that it should be left in the power of members of Parliament to say that their constituents had to go thirty miles to buy sheep-wash. Supposing that the power which it was recommended that the Society should possess were granted, it did not follow that they would be obliged to use it indiscriminately. He was, on the whole, in favour of the clause.

Mr. Wells said that since the last meeting of the Council he had communicated with nearly all the pharmaceutical chemists in Ireland, except those of Belfast and Dublin. In the two cities just named there were not more than seventy pharmaceutical chemists, or at all events there were not more than a hundred. That left over a hundred scattered through the rest of Ireland, of whom at least forty were in business on their own account. These were in towns having a population up to four thousand, and there were sometimes two in each town. He believed that if they only continued to prevent hucksters and others from selling poisons and continued to endeavour to carry out their Act, in a few years all the small towns would have pharmaceutical chemists in them. He believed that it would be a great pity to make the proposed grade. Out of two hundred licentiates of the Society, he had ascertained that the opinions of a hundred and sixty were totally opposed to it. If the clause were carried two members of the Council would resign and several members of the Society would cease to subscribe to it, and if that went on they would soon have no Pharmaceutical Society at all.

Dr. Montgomery said he was under the impression that the Council had already agreed to the principle embodied in this clause.

Mr. Doran: Only by a majority of one.

Mr. Hayes supported the clause. He believed the proposed grade was required even more now than it was in Sir Michael Hicks-Beach's time. The existing

arrangements were insufficient for the requirements of the country.

Mr. McIlwaine said he came from Newry, where there were three pharmaceutical chemists.

Professor Tichborne said there was something to be said in favour of the establishment of the proposed grade. No doubt there were small towns in Ireland where there were neither pharmaceutical chemists nor apothecaries, and that was the strong point for the clause. But there were a great many points against it. In his opinion, it was the original intention of the framers of the Act relating to the sale of poisons that the sale of such articles should be kept entirely in the hands of qualified men. At the same time they must bear in mind that it would be absurd to pass a law that it would be impracticable to carry out. It was undesirable to lay down the principle that the sale of poisons should be left in the hands of unpractised men. But if they passed the clause as it stood they would lay down that principle. Clause A. would tend to create a large body of men in towns where there was great competition, and it would not be long before they would try their hands at compounding.

Mr. Pring: They do it at present.

Professor Tichborne said he would propose the following amendment:—

"That it is desirable that the Council should seek powers to register persons for the sale of poisons in any post town in Ireland, where it is proved that there is no qualified man keeping open shop; and that candidates for the licence as registered druggists shall pass a prescribed examination."

This proposal he thought would meet the difficulty, for it avoided laying down the principle that it was desirable to create a new grade and only made an arrangement to meet an emergency. At the same time they would reserve protection for their own licentiates.

The amendment was not seconded.

The President said this question had been for some years before the Council, and they had almost all made up their minds upon it. Ever since he became a member of the Council he had felt strongly that a necessity existed for some such grade. Very small numbers of young men were coming up for their final examination. In Ireland, omitting the towns of large population, there were about two hundred and fifty towns having a population of from one thousand to two thousand five hundred, and it was in these and the districts surrounding them that the necessity for the proposed grade was felt. It would be cruelty to an educated man to fix him in some of those villages. It was quite within the power of the majority of the Council now to alter the decision that they came too not later than two months ago, but it would place them in a false position before the Government. There had been no public expression of feeling against this proposal from members of the Society outside the Council, and he had not had the slightest reason to believe that any number of members were opposed to it, except so far as was afforded by two or three anonymous letters in the press, which had no weight.

Mr. Payne observed that at the time when the late Sir Dominic Corrigan spoke of an existing want of extra accommodation, the Pharmaceutical Society was very young—it had not been more than twelve months in existence. Since then the Society had grown and many men had qualified themselves and were in business. Ballyshannon, which was a very small town, supported a pharmaceutical chemist, and also an apothecary. Clones had one pharmaceutical chemist; Athy had 2; Coleraine 2; Ballymoney 2; Newry 3; Monaghan 2; and Cookstown 1. These gentlemen would be still better able to maintain themselves if the sale of poisons were confined to them. In Belfast there were a number of pharmaceutical chemists and they objected very strongly to the creation of another grade; and he (Mr. Payne) was quite sure that if the pharmaceutical chemists in business throughout the country were asked their opinions as to this proposal, the majority of them would declare against it.

Mr. Grindley: They have been asked and we have their replies.

Mr. Wells: The Lord Lieutenant has already received a memorial against the proposal signed by over one hundred and fifty members of the Society, including ten members of the Council.

Mr. Payne said the plan of having an optional power would work most unsatisfactorily, because the constitution of the Council changed every two or three years, and the course which the majority of one year might decide on might be reversed by that of another.

The motion of Mr. Payne for the rejection of the clause was then put and carried by a majority.

The remaining clauses of the report were then dealt with.

Clause 3 recommended that it should be made unlawful for any save registered druggists, medical practitioners, pharmaceutical chemists, and apothecaries to sell patent drugs or poisons.

Agreed to.

Clause 4 recommended that it should be made unlawful for any registered druggist to keep open shop for the retailing, dispensing, or compounding of medical prescriptions.

Agreed to.

Clause 5 recommended that all registered druggists should pay an annual fee of 5*s.* to the Treasurer of the Pharmaceutical Society; that on or before the 15th March in each year a list of those who had paid should be forwarded to the inspector of weights and measures in each constabulary district; and that he should prosecute infringements of the law, and be entitled to one third of the penalty in each conviction.

Agreed to.

Clause 6 recommended that penalties for the infringement of the proposed enactments should be the same as and recoverable in the same way as under the Pharmacy Act.

Agreed to.

Clause 7 recommended that the word "person" in section 30 of the Pharmacy (Ireland) Act should be made to apply to all persons or associations of persons keeping open shop, and that each individual should be required to be duly qualified.

The President remarked that from what had happened with the English Bill he did not think there was much chance of that recommendation being included in a new Bill.

Mr. Wells: Perhaps the Government may do for us what they would not do for the Society at the other side.

The clause was agreed to.

Clause 8 recommended, in reference to the sale of patent and proprietary medicines containing poisonous ingredients, that a specification of the poisonous contents and the quantity of same should be printed on the label or wrapper; that the word "poison" should be printed on the various labels and wrappers, together with the name and address of the first seller; that the sale of such articles should be confined to legally qualified persons; and that persons convicted of contravening these regulations should be subjected to a penalty of £5 for the first offence, and of £10 for each subsequent offence: the seller so convicted to have power to recover from the owner of the medicine the amount of the penalty and costs on proof that the article had been sold in the same condition in which it had been received.

Agreed to.

Clause 9 recommended that a pharmaceutical chemist or apothecary keeping more than one open shop for the sale of poisons or medical prescriptions should employ in the shop in which he was not engaged a person who would himself be a duly qualified keeper of such shop.

Agreed to.

Clause 10 recommended that proprietors of shops for the sale of poisons and the compounding of prescriptions should be obliged to furnish, on application in writing, their names, addresses, and qualifications to the Registrar of the Pharmaceutical Society, under a penalty of £5 for each day of default, and that any person selling in the shop during such default should be liable to a penalty of £5 for each offence.

Agreed to.

Clause 11 recommended that any person fraudulently procuring himself to be registered, and anyone aiding or abetting him, should be deemed guilty of a misdemeanour, and liable to imprisonment for a period not exceeding twelve months.

Agreed to.

On the motion of Mr. Payne, seconded by Mr. Grindley, the recommendations as amended were adopted, and ordered to be printed, and copies sent to the Chief Secretary and to the Irish Members of Parliament.

Some other business having been disposed of, the Council adjourned.

Provincial Transactions.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

The fourth ordinary meeting of the above Association was held at the Owens College, on Tuesday evening, March 25. Mr. W. Wilkinson, Vice-President, in the Chair.

The minutes of the last meeting having been read and confirmed, the Chairman called on Mr. F. C. J. Bird to read a paper on "New Remedies," which was illustrated with specimens from the Owens College Materia Medica Museum.

Some Short Notes on New Remedies.

BY F. C. J. BIRD.

The author stated that the past few years had been remarkable for the large number of drugs (chiefly of vegetable origin) which had been brought under the notice of the medical profession, and highly recommended as specifics in various diseases. Many of these had attained popularity for a few months, and then not realizing the expectations of those making use of them, had quickly disappeared from prescriptions only again to be met with occasionally. Although this rage for new preparations was at times very perplexing to the physician, still it was not without its advantages, for should a hitherto unknown drug possess any real merit, it would stand a chance of getting a trial, and instead of remaining uselesss and unappreciated in its original habitat its remedial qualities would be utilized for the benefit of mankind. The greater part of these new remedies were of both American origin and introduction, and appeared to have been discovered or at least first used pharmaceutically by the eclectic practitioners of America, whence many of them are commonly termed "eclectic remedies." The word "eclectic" really meant selected, but now conventionally it is understood to refer to a class of medical men in America, who confined the drugs used in their practice to substances obtained from the vegetable kingdom only, and who, when they have exhausted the drug by treating it with alcohol, precipitating the tincture with water, and drying the resulting resinoid powder, believed the preparation thus produced to represent the entire active constituents of the drug divested of all inert woody matter, etc. For a long time this class of practitioners was regarded to a certain extent, by medical men of the other school, in the light of quacks, but the valuable qualities of some of their now well-established remedies, as podophyllin, iridin, etc., have done much to remove that feeling.

The author then proceeded to describe in detail the following drugs, their uses and applications:—*Berberis aquifolium, Rhamnus purshiana, Grindelia robusta, Aspidosperma Quebracho, Loxopterigium Lorenzii, Convallaria majalis, Lippia Mexicana, Viburnum prunifolium, Franciscea uniflora.*

After the reading of the paper a discussion ensued, in which the Chairman, Messrs. Elborne, Benger and Kirkby took part.

Mr. Bird having replied, the Chairman then called on Mr. Kirkby to read his paper on "Kamala."

This paper will be printed in an early number.

After the reading of the paper a discussion followed, in which the Chairman, Messrs. Elborne, Benger and Hermann Woolley took part. Mr. Kirkby having replied, hearty votes of thanks were accorded to Messrs. Bird and Kirkby for their admirable papers, which were carried with acclamation.

Mr. Elborne then drew the attention of the meeting to some recent donations to the Owens College Materia Medica Museum, which gave rise to a discussion, in which the Chairman and Mr. Hermann Woolley took part. The meeting then terminated.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Thursday evening, March 27, Mr. W. Buckley read a paper before the members of the above Association on the subject of "The Doctrine of Evolution." The chair was taken by Mr. A. E. Martin, President.

The essayist commenced by defining the term, and remarked that it was generally confounded with the Darwinian theory, and gave an extract on the meaning of "Evolution" from Dr. Hooker. He then proceeded to describe the various forms of animal life, beginning with the gregorina, and treating the other forms to the vertebrata. Gregorina was described as an animal which is found as a parasite of the cockroach, which takes in its food in any part of its surface. This is the lowest form of animal life. Amœba was then described as *seizing* its food, which is forced through the mass of protoplasm and excreted anywhere. Infusoria formed a step higher, in the possession of a definite mouth and œsophagus and egestive region. Waterweed hydra, sea anemone, entozoa, earthworm, leech, insect, vertebrata were all described in order of superiority, the various changes in the structure of the same being pointed out until the highest form of animal life was reached in the case of vertebrata. He then explained evolution of reproduction, descrlbing the mode of reproduction (in the first place) of the gregorina by incystation, that is, the animal surrounds itself by a mass of gelatinous matter and then splits up, each part becoming a fresh animal. Infusoria were described as being reproduced by splitting into two equal parts and also by budding, a portion becoming attached to the animal, and after some time becoming free, and having the powers of its predecessor. The different modes of reproduction were fully described in each case, to the vertebrata as in the human being. The whole of the descriptions were most interesting and easy to follow, as the essayist handled the subject in a masterly manner. The descent of man was next noticed, Mr. Buckley showing the similarity of the structure of some monkeys to human beings—more especially the chimpanzee and gorilla. The useless muscles of the human body were spoken of and the reason why they were useless explained. The facts of evidence of relationship of some apes to man was fully treated upon.

The whole of the paper was most interesting and was enjoyed by all present, as their great attention to the delivery of the same showed.

After a discussion, in which the arguments antagonistic

to the Darwinian theory were given and discussed by most of the members present—

Mr. J. Lees proposed a vote of thanks to Mr. Buckley, which was seconded by Mr. C. G. Wood (Sec.) and carried.

HAWICK PHARMACEUTICAL ASSOCIATION.

The monthly meeting of the above Asscciation was held on the evening of Tuesday, the 1st inst. The Hon. President (Mr. Maben) occupied the chair. There was a large attendance.

The minutes of the former meeting having been approved,

Mr. M. Dechan, Analytical Chemist, read a paper on "Milk and Milk Analysis." Referring first of all to milk as an article of diet, Mr. Dechan showed by reference to its composition that it was a perfect food. It contained all the substances that were required for the nourishment of the various parts of the body, and these in the proportions in which they were most required. Milk consisted largely of water, which was necessary as the basis of the blood and of the various juices of the system; it contained the nitrogenous constituents essential for producing muscle, and repairing the continual waste of tissue, as well as the sugar and fats required for maintaining the animal heat, and the mineral matters or ash, which went to form bonc. Going on to consider the milk of different animals, he pointed out that mare's milk contained the largest proportion of sugar and the smallest of the albuminoids and fats, the milk of the ass coming next in these respects. On this account these milks were peculiarly valued as a diet for consumptive patients. With regard to the sugar and the proteids they came nearer the composition of woman's milk than that of any other domesticated animals, but the same remark did not hold good of the fat, which was presenl in human milk in somewhat similar proportion to that in which it occurs in the milk of cows.

Proceeding to the second part of his subject, the analysis of milk, Mr. Dechan pointed out that here, of course, we have usually only to do with cow's milk. In the first placc, there was grcat differcnce of opinion regarding its percentage composition, or, rather regarding what ought to be looked on as genuinc milk. Different cows, and even the same cow on different food, varied as to the quality of thcir milk. This had led to disputes in which a certain amount of bad feeling had been shown among analysts, some, and these the large majority, maintaining most strenuously that genuine cow's milk ought to contain not less than about 12 per cent. of total solids, and that even this was a very low estimate, while others hold that milk had been got with a much lower percentage than this. The natural result of this conflict of opinion was that the public interest suffered. Endeavouring to account for the way in which these discrepancies might have arisen, Mr. Dechan explained that in milking cows, the milk that flowed first was poorest in fat, while that last drawn was poorest in solids not fat. It might, therefore, have happened that samples of milk from one portion only of the milking had been analysed, and while in one sense this was perfectly genuine milk it was obviously quitc unfair to take it into account in fixing a standard.

Then, again, thcre was a difference of opinion as to the method by which milk should be analysed. Having described Wanklyn's method, that of Somerset House, and that approved by the Society of Public Analysts, Mr. Dechan critically examined each, pointing out that no one was in all respects perfect. He then explained the method which he had been using, along with Mr. Maben, for some time. This consisted essentially in employing a continous extraction apparatus, modelled on the principle of Soxhlet's tube, and using ether as a solvent. By this means the fat was readily and completely separated from the solids not fat. These were then dried, and their combined weights corresponded, when the analysis was correctly carried out, with the total solids which were determined separately. The amount of ash was obtained by igniting the solids not fat, and weighing the residue. Milk analysis did not go further usually than this, but if the proximate constituents of milk were all required the solids not fat would be again analysed to ascertain the proportions of proteids and milk sugar, and the ash for the amount of phosphate of lime, chloride of sodium, and other salts.

Mr. Dechan was listened to throughout with great attention, and, at the close of his paper, which had been illustrated with diagrams, he received a hearty vote of thanks.

Several questions having been put and answered, it was intimated that the annual business meeting of the Association would be held next month.

LIVERPOOL CHEMISTS' ASSOCIATION.

The eleventh general meeting of the thirty-fifth session was held, at the Royal Institution, March 13, 1884. Mr. Edward Davies, President, in the chair.

The minutes of the previous meeting were read and confirmed, and the following donations to the Library were announced;—*The Pharmaceutical Journal*, from the Society, and the *Science Monthly*, from the Editor.

The President announced that in accordance with the intimation he gave at the last meeting respecting the letter of resignation from their Vice-President, Mr. Alfred H. Mason, that same had been brought before a Special Council Meeting, and that it had been resolved to accept same with deep regret, and also to make Mr. Mason an honorary member of this Association.

Mr. Arthur Crosfield, was then elected a member.

Mr. J. C. Bredin described experimentally a test for the detection of nickel and cobalt, by means of the ferro- and ferri- cyanides of potassium, which he stated was employed by Mr. R. H. Davies, and described in the *Chemical News* (vol. xxxii., p. 44).

Mr. J. T. Hornblower exhibited purified crystals of barosma camphor, the stearopten of buchu oil, which was obtained from *Barosma betulina* and *Barosma serratifolia*.

Dr. Symes exhibited some leaves, which were packed with a parcel of kola nuts, and which he found on examination to be the leaves of the kola plant.

The President then read a paper entitled—

Notes on Testing for Arsenic.

BY E. DAVIES, F.I.C., F.C.S.

In all ages poisoning has been a crime which has excited the greatest amount of reprobation, both on account of the cowardly nature of the attack on the life of the victim, which leaves him without the means of defence, and also from the difficulty of its detection. In olden times before chemical analysis was discovered, chemistry, as then known, was long employed for the preparation of deadly agents. Indeed, if we could credit the tales of Italian and French poisoners, we should have to admit that they were far in advance of chemists of our own time, as they were believed to be able to administer poison in gloves, perfumes, and even so to prepare the leaves of a book that by touching with the fingers and then moistening them with the saliva in order to turn over the pages, enough poison could be taken into the system to produce death. We read of mysterious concoctions of herbs, distillation of compound mixtures, necessitating the use of glass masks,—by the way, a most futile precaution against the inhalation of poisonous fumes,—and all the paraphernalia so useful to the romance writer who wishes to give a great scientific-dramatic colouring to his works. No doubt the poisoners of that day did, in their ignorance of the chemical nature of the materials on which they worked, combine—

"Eye of newt, and toe of frog,
Wool of bat, and tongue of dog,
Adder's fork, and blind-worm's sting,
Lizard's leg, and owlet's wing,
For a charm of powerful trouble,"—

but the really active ingredient was some simple substance, such as aconite, sugar of lead, and above all, arsenic.

About 1700, a woman named Toffana or Tophania, living at Palermo, and afterwards at Naples, attained a baleful reputation by her preparation of a poison known as "aqua della Toffana." In Beckman's 'History of Inventions,' it is stated that this preparation, as well as that employed by the Marchioness de Brinvilliers, were almost certainly "arsenical mixtures, or as Dr. Hahneman rightly conjectures, neutral salts of arsenic. Loss of appetite, faintness, gnawing pains in the stomach, loss of strength without any visible cause, a continual indisposition, followed by a wasting of the viscera, a slow fever, etc., are all symptoms which seem to announce that dangerous metallic oxide." And in a note he adds an extract from 'Hoffmanni Med. rationalis System.' p. ii., c. 2, section 19, 1718 or 1719. "Garelli, the Emperor's principal physician, lately wrote to me something remarkable in the following words:—'Your elegant dissertation on the errors respecting poisons, brought to my recollection a certain slow poison, which that infamous poisoner, still alive in prison at Naples, employed to the destruction of upwards of six hundred persons. It was nothing else than crystallized arsenic, dissolved in a large quantity of water by decoction, with the addition, but for what purpose I know not, of the herb cymbalaria. This was communicated to me by his imperial majesty himself, to whom the judicial procedure, confirmed by the confession of the criminal, was transmitted. This water, in the Neapolitan dialect, is called aqua del Toffnina. It is certain death, and many have fallen a sacrifice to it.'" The allusion to neutral salts of arsenic is especially interesting, as the arsenate and arsenite of soda have just attained such prominence as poisonous agents.

The truth is that it was not so much the mysterious nature of the poison employed as the inability of the chemists of the day to detect small quantities of mineral poisons which gave to mediæval poisoners the impunity which they often enjoyed.

Previous to the introduction of Marsh's test there was no method by which small quantities of arsenic could be detected. Mr. Marsh, of Woolwich, discovered this process in 1836. It can, no doubt, detect smaller traces of arsenic than any other, but it has two great disadvantages. It cannot be used when a small quantity of arsenic is contained in a large quantity of organic matter, until the organic matter has been destroyed, as the frothing occasioned by it is an insuperable obstacle. Its extreme delicacy is almost an objection, as, though the zinc and sulphuric acid can be tested absolutely in the apparatus, the same is not the case with all the chemicals which have been used in the preparation of the solution. This is not the case with Reinsch's and Fresenius' tests, in each of which everything can be tested in blank experiments.

Reinsch's test, first proposed in 1843, is still, in many respects, the most useful test for the detection of arsenic. A slip of copper, boiled with the suspected material, acidulated with hydrochloric acid, soon becomes coated with an alloy of arsenic and copper. The mere staining of the copper alone is not a sufficient indication of the presence of arsenic. Antimony, mercury, and, in some instances, it would appear, organic matter, may produce a stain resembling that caused by arsenic. By heating the slip in a tube closed at one end we get the arsenic volatilized, and then oxidized into arsenic trioxide. I have found that if the part of the tube upon which the crystals of As_2O_3 are to be deposited is first warmed, the crystals are much more distinct and perfect in crystalline form. Another point which I have found exceedingly important, is to remove any fatty matter which may have deposited on the copper slip, by boiling it in ether. In all cases in which animal matters are boiled with the slip and acid, fatty matters are present and often adhere strongly to the copper. If they are not removed fatty globules of fat and tarry matters mix with the crystals and render them indistinct.

I have also made some experiments to ascertain whether sulphide of arsenic would give the reaction with Reinsch's test. One-tenth of a grain of arsenic trioxide dissolved in water was precipitated as sulphide, filtered and washed thoroughly with water. The precipitate was divided into two parts, and one part, equal to one-twentieth of a grain, was boiled with about one ounce of water acidulated with HCl, and a slip of copper introduced. It was some time before the copper was stained, but in two hours it was completely coated, and a fine deposit of As_2O_3 obtained by sublimation. It thus appears that the test may be applied successfully in any case, however long a body may have been interred.

A great merit of the process is the fact that no previous preparation of the organic matter is necessary, and as both acid and copper can be sufficiently tested by gently simmering the acid diluted with three or four times its bulk of water with a slip of the copper for five or six hours, there is no risk of introducing any arsenic into the material.

To some extent this process may be used for quantitative determination. By boiling the material with successive slips of copper until no more are stained, on heating in a capacious tube the arsenic is obtained free from organic matter. It may then be dissolved and precipitated at As_2S_3. It, however, takes a long time to remove all the arsenic, and some other method is desirable which will enable larger quantities of material to be acted on. Many have been devised for destroying the organic matter, which may be summarized as follows:—1. Destruction by sulphuric acid alone or in conjunction with nitric acid. These methods involve the use of large quantities of sulphuric acid with risk of thus introducing traces of arsenic, and on the other hand all animal matters contain small quantities of chlorides, and on heating with strong sulphuric acid chloride of arsenic is sure to be formed and volatilized. 2. Oxidation by means of nitrate of potash. Large quantities of nitre must be used, or if the carbon is not entirely burnt, arsenic in the elemen tary state will be evolved. Then the nitrates and nitrites in the residue must be entirely decomposed by sulphuric acid. This introduces the former objections.

Dr. Taylor advocates the thorough drying of the organic matter and then adding strong hydrochloric acid and distilling. The distillation should be carried to dryness and repeated when the arsenic will be volatilized and condensed in the receiver. This method does give good results sometimes, but it is very difficult to get the organic matter quite dry, and the contents of the retort are very apt to bump. The distillate is not free from organic matter.

The process known by the name of Fresenius and Babo's consists in heating the organic matter with hydrochloric acid, so that the strong acid shall not be more than one-fourth of the bulk of the water present or if necessary added. Chlorate of potash is added in successive small quantities until the solution is a light yellow colour. This is filtered and the residue thoroughly washed. The filtration takes place rapidly and a clear liquid is obtained. The filtrate is heated for some time to remove any chlorine, then boiled with pure solution of sulphurous acid, the excess of sulphurous acid boiled off and well washed. Sulphuretted hydrogen is then passed in slowly for two or three hours. The liquid is gently warmed for some time to remove excess of H_2S, and the precipitate filtered off and washed until quite free from chlorine. The precipitate and filter are dried and treated with pure fuming nitric acid. The residue is dried and

moistened with strong sulphuric acid. After heating for some time on a water-bath, it is heated for two hours in an air-bath at 150° C. The charred mass is then boiled with dilute HCl and H_2S passed in. The sulphide of arsenic is then precipitated pure and is most conveniently weighed by dissolving off the filter with dilute ammonia and evaporating to dryness in a weighed porcelain dish. It is well to moisten with strong H_2S solution and evaporate again. The sulphide may then be oxidized with fuming nitric acid, and the solution of arsenic acid tested in various ways.

Objections have been raised with regard to this process. First, it has been supposed that arsenic may be lost in the first treatment. The HCl is too weak to admit of the formation of chloride of arsenic, but as the operation may very well be conducted in a retort any loss can be prevented. The complexity of the process has also been urged as an objection, but in practice this is not found to be the case. There is rather a large number of reagents used, but the quantity of each is small, and besides testing each separately a blank experiment can be easily made, where by using meat for organic matter and double quantities of each reagent the purity of the whole can be proved. Practically, I have never failed to find arsenic by this process when Reinsch's process has shown it to be present, and I have never found it when Reinsch's test has shown it to be absent.

Fresenius and Babo's method has the advantage that it enables us to ascertain the presence of other poisonous metals without the introduction of copper.

Dr. Nevins said he had listened to the paper with very great interest, as the subject of it was one in which he had taken a practical interest during many years of chemical experience. He concluded by moving a hearty vote of thanks to Mr. Davies.

Mr. Conroy, in seconding the vote of thanks, considered the paper showed a most valuable digest of the facts of a long practical experience, and he hoped it would be published, as it would prove a most valuable record for future reference.

The discussion was continued by Dr. Symes, Mr. Ward and Mr. A. C. Abraham, and the vote of thanks was carried by acclamation. Mr. Davies having replied, the proceedings terminated.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, April 3. Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificates were read for the first time:—R. St. Stephens and R. C. Tresidder.

Professor P. T. Cleve, of Upsala, was present at the meeting, and was formally admitted as a Foreign member.

Mr. Salamon read a paper—

On the Influence of Certain Phosphates upon Vinous Fermentation. By A. G. Salamon and W. de Vere Mathew.—Considerable difficulty is often experienced in the course of the manufacture of beer by the method of high fermentation, in producing a sufficient attenuation of the wort in a given time. Under such circumcumstances it is constantly urged that the addition of certain salts of phosphoric acid will exercise such a stimulating influence upon the growth of the yeast organism as to materially increase the rapidity of the attenuation of the wort. The authors undertook the present series of experiments to determine whether such a stimulation is really obtained. They have estimated the vigour of the fermentation by the amount of sugar consumed in a given time; the sugar left after the fermentation being determined gravimetrically as recommended by O'Sullivan. The following Pasteur's solution was used as a fermenting medium:—Water, 100 c.c.; potassium phosphate, 0·233 gram; calcium phosphate, 0·02 gram; magnesium sulphate, 0·023 gram; ammonium tartrate, 1·166 gram; cane sugar, 17·490 grams. The temperature of the solutions was maintained at 60° F., and the duration of the experiments was usually sixty hours. The following may be given as an example of the experiments. One hundred c.c. of Pasteur solution were used with 5 grams of pressed yeast.

Sugar consumed in grams. Per 100 c.c.	Potassium phosphate in grams. Per 100 c.c.
8·5770	0·0000
8·5896	0·0575
8·5001	0·1150
8·7666	0·1720
9·6884	0·2300 (= ·0770 P_2O_5)
9·9124	0·2875
7·7586	0·3450
7·5948	0·0425
7·8878	0·4600
7·2850	0·5175

Time, forty-eight hours.

It is seen that the maximum fermentation occurs when 0·23 gram of potassium phosphate is present per 100 c.c. which is the normal amount in Pasteur's solution, a larger quantity is obviously fatal to the proper activity of the yeast ferment. Similar experiments proved that although small quantities of calcium and magnesium phosphates were benficial an excess was most injurious. Now the normal amount of P_2O_5 in an English beer wort is about 0·1160 gram, and in the normal Pasteur solution 0·0875. The ordinary wort contains therefore an excess of P_2O_5 over that which has been found to be most favourable to fermentation, hence it follows that it is not advisable to add phosphates for the purpose of accelerating the attenuation of ordinary beer worts.

The President asked if the authors had made any experiments to decide whether the alteration in activity was due to the potassium salts or the phosphoric acid.

Mr. Warington said that in the tables where the authors had stated the phosphoric acid as 0·00 gram the P_2O_5 in the yeast still had to be taken into account, because probably if no P_2O_5 were present no yeast growth or transformation of sugar would take place. It seemed that it was not at all proved that the action was due to the phosphoric acid. It would be interesting to know what would happen if another salt, as potassium sulphate, was substituted for potassium phosphate.

Mr. Salamon said that their object was to ascertain whether it was advisable to add phosphates to the wort or not, and from the experiments it seemed that this question must be answered in the negative.

The Secretary then read a paper—

On the Occurrence of Rhabdophane in the United States. By W. N. Harley.—In the *American Journal of Science*, xxv., 459, Brush and Penfield describe a new mineral from Salisbury, Conn., under the name of scovellite. This mineral agrees in physical properties, etc., with rhabdophane (*Chem. Soc. Journ. Trans.*, xli., 210), and seems to be a variety of that mineral containing erbium and yttrium, associated with lanthanium carbonate. In a subsequent number of the *American Journal of Science*, March, 1884, Brush and Penfield have recognized this identity of scovellite with rhabdophane.

The Society then adjourned to April 17, when a paper on "The Synthesis of Galena," by Emerson Reynolds, will be read.

SOCIETY OF ARTS.

Alloys used in Coinage.

The final lecture of the Cantor course on "The Alloys used for Coinage" was delivered by Professor Roberts on the 7th inst., and treated more especially questions connected with the liability to reduction in weight of various coins by wear during circulation, and the different modes in which coins are liable to be criminally

tampered with. Abstracts from the laws relating to the tests to which coins should be submitted were read by the lecturer, who showed clearly how the present laws were based upon and nearly equivalent to those of very early date. He then described various methods that have been employed to correct gold coins which are either slightly above or below the standard weight, 123·274 grains if the coin be a sovereign, or 61·637 grains if it be a half-sovereign. The adjustment has been made by means of a hand-file up till quite a recent date, and some ingenious mechanism has been invented for the same purpose, but the disadvantage of any mechanical method is that the marks of the file or other instrument are never entirely obliterated. Chemical aid has been called into request, and amongst other methods the coin has been subjected to the solvent action of *aqua regia*, but this could only be used when the coin was too heavy. Another method of greater efficiency is the immersion of both the light and heavy coins in a solution of potassium cyanide, and the passage of an electric current through the coins; the result, as Professor Roberts showed by experiment, being that a small portion of the alloy is passed from the heavier coin to the lighter, thus bringing them to the same weight. In the course of the evening the lecturer drew attention to an ingenious apparatus used at present in the Royal Mint, by which the coins above or below the remedy of the standard weight are rejected. Professor Roberts did not attempt, however, to give more than an idea of the working of the machine, a working model of which he had present, but referred persons interested to the 'Encyclopædia Britannica' for details. He then remarked upon the illegal tampering with coin and the steps taken to prevent it. The old method of clipping coin had been prevented by laws enacting that no coin should be tendered in which the sculpture or outside ring did not remain whole; but the lecturer considered the best method of preventing clipping was, the lettering or milling of the edge of the coin. An ingenious method, which Professor Roberts jokingly classed as an American industry, consists in splitting the gold coin and removing the middle portion, after which base metal is introduced in place of the gold alloy extracted and the coin again made whole by soldering. Formerly, coins were weighed by the pound and not separately as at present, so that many of the coins though far heavier than they should be were circulated owing to the presence of light coins. A profitable, though illegal employ of culling coin, that is to say extracting the heavier coins, was extensively carried on, and numerous instances were cited of cases concerning this practice appearing before the Star Chamber. The liability to reduction in weight by wear in circulation would be greatly influenced by both the form of the coin and the nature of the alloy. Theoretically a perfect sphere would be the most durable shape for a coin, as combining maximum weight with smallest surface, but this, as well as a short cylinder, would be a very inconvenient shape; the present cylindrical form is therefore used. Further, a coin struck in low relief would present less chance of disfigurement than one of high relief. If coins of pure metal be brought continually into contact with each other they will soon be reduced to the state of mere counters; but the slightest addition of base metal to form an alloy is followed by a marked difference in the durability of the coin. Experimentally it has been proved that there is no appreciable difference in durability between the English and continental standard alloys; the annealing process also greatly contributes to enable the coins to resist wear in circulation. The rate of wear is fairly uniform, the new coins losing nearly the same amount of metal as old coins, the annual loss averaging about 0·043 grain; thus a coin of standard weight will keep in circulation about eighteen years before falling below the remedy allowed by law. These remarks do not apply to bronze coins, which are withdrawn from circulation when defaced. It is remarkable that at the present time only about one-third of the gold and silver coins struck are retained in circulation in this country, the remainder, which formerly formed a much larger proportion, being exported or melted down as bullion. In reference to some experiments which Professor Roberts had himself made, he stated that coins of aluminium resist wear to a singularly high degree, which is further raised by a slight addition of nickel. In concluding he remarked that the Government would take no steps in the improvement of coinage until urged to do so by the people, who at present had no idea of the main features of the question.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, March 27, Mr. H. G. Greenish, Vice-President in the chair.

The first paper read was on "Unofficial Indigenous Materia Medica," by E. J. Eastes.

The paper will be printed in a future number of this Journal.

The paper was illustrated by dried specimens of the plants alluded to, and was followed by a discussion in which the Chairman, Messrs. Dymond, Ince, McDiarmid, and Short took part.

A vote of thanks was passed to Mr. Eastes.

The Secretary (Mr. Dunstan) then made a Report on Organic Chemistry on "Metethaldehyde."

The paper will be printed in a future number of this Journal.

The report was experimentally illustrated and was followed by a discussion in which the Chairman, Messrs. Dymond, Evans and Lowe joined.

A paper was next read by the Secretary—

Note on the Crystallization of Sodium Hydrate.

BY R. A. CRIPPS.

A short time ago I had occasion to prepare a very strong solution of sodium hydrate, and was somewhat surprised to find that after a short time long colourless crystals appeared in the liquid. On examination they proved to be hydrate of sodium. I found by reference to Watts's 'Dictionary' that this result had previously been obtained, but no formula is given for the crystals. To determine this the water of crystallization was estimated by heating the previously dried crystals to fusion, and was found to be 38·01 per cent. The sodium hydrate was also estimated and 62·91 per cent found. These figures agree sufficiently well with the formula $3NaHO, 4H_2O$, which requires 37·5 per cent. of water. The melting point was about 60° C., but the extremely deliquescent nature of the crystals rendered its accurate determination difficult.

The conditions most favourable for the production of the crystals are as follows:—One pound of sodium hydrate in sticks (preferably containing a little sodium chloride) is packed in a cylindrical glass vessel, a tall beaker for instance, of such a size that on adding $7\frac{1}{2}$ ozs. of water the sticks are just covered; the whole is well stirred at intervals during a quarter of an hour, and then another ounce and a half of cold distilled water stirred in, after which the whole is set aside for about an hour and a half, about one third of the soda being still undissolved. At the end of that time the temperature will have fallen to about 40° C., and the crystals will have separated; the liquid is decanted from the crystals, which are allowed to drain and lastly dried *in vacuo* over sulphuric acid. The temperature of the solution should not be allowed to get quite cold, as the whole then becomes pasty and the crystals cannot be separated.

Potassic hydrate treated in the same manner gave no indication of crystallization.

A specimen of the crystals was exhibited.

After some remarks by the Chairman, Secretary and Mr. Ince, a vote of thanks to Mr. Cripps was passed.

Miscellaneous business being announced, Mr. P. L. Huskisson showed some very large crystals of phosphoric acid, about three inches in length, and some crystals of potassio-ferric oxalate which had been produced during the evaporation of an impure solution of neutral potassium oxalate.

Both these specimens have been presented to the Museum of the Pharmaceutical Society.

The meeting then adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association, held on March 26, 1884, Mr. Parkinson (President) in the chair, a paper on "Emulsions" was read by Mr. Joseph Ince.

The author commenced by defining an emulsion as in most cases a mechanical mixture of two substances which are insoluble the one in the other, and the surfaces of which when brought together do not adhere but rather repel each other, and pointed out that in such instances mechanical mixture cannot be readily maintained unless something be added which can establish a sufficient amount of adhesion to overcome the tendency to separation. The author then described the methods by which emulsions are best prepared, there being two distinct directions to be given to trituration in making an emulsion. In a mortar the action is towards the dispenser; on a pill tile or slab, the action is from the dispenser; the first from left to right, the second from right to left; right and left are determined by the position occupied by the mortar or slab as it faces the operator. There are also two distinct mechanical applications to be used; viz., almost total absence of pressure in the case of liquids, and vigorous pressure in the case of solid substances to be reduced into a fine state for forming an emulsion. Slight modifications occur in practice which may be trusted to the good sense of the dispenser, but the main principle holds good. When liquids, limpid or viscous, are to be combined, the very gentlest manipulation should be employed; increase of pressure generates heat, and heat is fatal to union, thus when olive oil, mucilage and water are to be emulsified, while care must be taken to have the three entirely under the control and action of the pestle, at the same time lightness of hand cannot be too carefully studied. The common advice to press vigorously on the bottom of the mortar will be found to be incorrect. On the other hand, when a solid has to be broken down and worked into a pasty saponaceous mass an exactly opposite mode of treatment must be adopted. The object is to produce a kind of soap which can be only extemporaneously manufactured by strong continued muscular action, with evolution of heat to effect the change. Myrrh, ammoniacum and similar substances may be taken as examples which require this treatment. The author then alluded to several emulsions individually, first giving the following as a type of an excellent emulsion:—

℞ Ol. amygdal dulc.		℥iss.
Mucilag. acaciæ		℥iij.
Syr. simp.		℥iss.
Aq. dist.	ad	℥iij.

Here the chief points to be observed are absence of acidity from the mucilage, lightness of hand and quickness in manipulation. Mist. ferri co., B.P., was then mentioned, various ways of manipulation being given, the following method being considered the best: beat the myrrh as usual, divide with the sugar, add the potash and make a thick creamy emulsion with just sufficient water, let them stand covered from the air over night and the following morning finish the operation. A few minutes' trituration will restore the whiteness, and such a mistura ferri co. will keep for some years without alteration. Methods for the best ways of emulsifying ammoniacum, assafœtida, guaiacum, etc., as well as ol. terebinth., were all fully described.

In the discussion which followed, the President, Messrs. Flintan, Millhouse, Taylor and others took part.

A vote of thanks to Mr. Ince for his valuable paper terminated a very successful meeting.

Obituary.

PETER SQUIRE, F.L.S.

With profound regret we put on record the death of Mr. Peter Squire, on Sunday last, at his residence, York Gate, Regent's Park.

Mr. Squire was born at Stratton, in Bedfordshire, in 1798, and therefore at the time of his death he was in in his eighty-sixth year. At the age of fourteen he was apprenticed to a chemist and druggist at Peterborough, and like many other apprentices of those days seems to have had an experience which, however conducive to a mastery of the minutest details of the business, was scarcely so favourable to the comfort of the apprentice. Notwithstanding the disadvantages of long hours,—seven a.m. to eleven p.m.,—the lad, having a love for botany, gave life to his studies of a folio edition of Sir John Hill's 'Herbal,' by the examination of flowers collected in early morning rambles in the fields. In this way he laid the foundation of the sound knowledge of botany which in after years was to be so useful in his business and in the examination room. Shortly after the termination of his apprenticeship he came to London and entered the house of Wilson, Minshull and Co., Snow Hill, where he became the head of the "wet" department and supervisor of the laboratory. Three years afterwards he took charge of the "dry" department in the house of Hodgkinson, Brandram and Stead, Thames Street. From thence he went to Oxford Street to live with Mr. Alexander Garden, the partner of Frederick Accum. There he spent eight years, during a portion of which he enjoyed a share in the business, and at this time his attention seems to have especially turned to the study of chemistry, the lectures which Brande and Faraday delivered at that time at the Royal Institution to the pupils of St. George's Hospital at eight and nine in the morning being attended. The partnership with Mr. Garden having expired, and the position being taken by that gentleman's own son, Mr. Squire paid a visit to Paris, where through an introduction by M. Bertin, the physician to Prince Polignac, then French Ambassador in London, he acquired the privilege of attending the pharmacy of M. Beral in the Rue de la Paix, and thus acquired an insight into the way the business was carried on in France.

Having thus acquired experience from various sources, Mr. Squire, about the year 1831, bought the business in Oxford Street, with which he remained associated for upwards of half a century, from a Mr. Scott, who had carried on a dispensing business there for forty years previously. Mr. Squire now turned his attention to the improvement of medicinal extracts. At that time scarcely one of them could be distinguished from another either by colour or odour. It was impossible for Mr. Squire to prosecute any researches during the day, as he was occupied from seven a.m. to eleven p.m. He accordingly resolved to enter upon a series of experiments after supper and when others had retired to their beds he descended into the laboratory where he remained until one, two, three, and sometimes even four o'clock, as the various experiments might render it necessary, for he never felt exhausted.

The result of these experiments was that these important preparations for the first time appeared with their proper physical characters apparent by the peculiar colour and odour of the plant from which they were derived. The dried leaves and the tinctures made from

them next received his attention, and acting under the belief that as the leaves of plants during the process of drying must necessarily be chemically acted upon by the air, the juices expressed from them, preserved by only just enough spirit to keep them from change, might prove superior to tinctures, he, in 1835, made some such preparations of conium, belladonna, digitalis, hyoscyamus, and other plants, and had them tried by his medical friends. He was soon persuaded of their advantage. The digitalis preparation was much employed by one practitioner, who declared that he could bring down the pulse far lower by the preserved juice without producing nausea than he could by the tincture.

These researches of Mr. Squire brought him under the notice of many eminent medical men. Amongst these was Sir James Clark, then Dr. Clark, who was no mean judge of pharmaceutical preparations. He made many visits *incognito*, examined the several tinctures and other preparations with apparent interest, and frequently spent half an hour in conversing upon medicine. Dr. Clark kept his *incognito* until he was satisfied by every inquiry, and then, sending for Mr. Squire, said, "You will recollect our frequent conversations. I have made the inquiries about your general character, and I wish you now to sit down and give me an account of yourself, where you were educated, and what progress you made at school; where apprenticed, and by what means you have acquired the knowledge that you evidently possess of your business." This being answered, he handed Mr. Squire a prescription for H.R.H. the Princess Victoria. His appointment as chemist to the princess followed immediately after (1836), and when the medical staff of the Queen was published in the *Royal Gazette*, immediately after Her Majesty's accession in 1837, the name of Peter Squire appeared as Chemist in Ordinary on the establishment. When he retired from this post in 1877 he had completed his fortieth year of service.

In 1841 Mr. Squire commenced the long series of services rendered by him to the Pharmaceutical Society of Great Britain, he having been a member of the Committee to which the meeting at the Crown and Anchor entrusted the task of drawing up a constitution and framing bye-laws. This Committee carried on the business of the Society until the election of the first Council in 1842, among the members of which Mr. Squire was included. He took an active part in the organization of the Board of Examiners, and for twenty-seven years he occupied a seat upon it. When he retired from the Board in 1869 he was presented with an address, signed by every member of it, couched in the following terms:—

"The Board of Examiners desire to place on record their high appreciation of the valuable services rendered by their esteemed colleague Mr. Peter Squire in organizing and so ably carrying forward the important work of examination from the very first meeting of the Board in July, 1842, to the present time," etc.,—Dated June 11, 1869.

In 1849 Mr. Squire was elected President of the Pharmaceutical Society; and after an interval of twelve years he was again elected in two successive years. His exertions about this time, with others, to secure the exemption of pharmaceutical chemists from jury service cost him a severe illness. Mr. Squire continued a member of the Council until 1870. During his active connection with the Society he contributed a number of important papers to the evening meetings.

When the news arrived of painless operations being performed in America under the influence of ether, Mr. Squire constructed the apparatus by which the first capital operation was performed by Mr. Liston at the University College Hospital, which apparatus is now in the museum of that hospital. Mr. Squire assisted Dr. Stevens in his investigations on human blood, and he likewise assisted Dr. Marshall Hall in his experiments on the subject of the resuscitation of the apparently drowned (the so-called ready method).

Mr. Squire was a founder of the College of Chemistry, which formerly occupied the premises now used by the Medical Council. He was also one of the founders of the Royal Botanic Gardens in the Regent's Park, and a fellow of the Linnæan Society.

With regard to the works written by Mr. Squire the first to mention is 'The Three Pharmacopœias Compared' (1851). This work contained the entire contents of the London, Edinburgh and Dublin Pharmacopœias set side by side in three columns (Royal 8vo) in order to show the alarming differences in strength of preparations bearing the same name, and the danger of a prescription written in London being made up in Dublin, say twelve hours afterwards. Such a prescription might, in the case of acetum colchici for example, have three times the power the prescriber intended. A risk of this kind in days of railway travelling was considered a great evil and almost the first act of the Medical Council was to resolve upon having a National Pharmacopœia which should supersede those of London, Edinburgh and Dublin.

A committee for this purpose was appointed, and the Pharmaceutical Society was requested to send its delegate to be a member of the Committee, and Mr. Squire was chosen. Dr. Farre, Dr. Garrod and himself were to represent the London section of the Committee. Dr. Apjohn, Dr. Neligan and Dr. Aquilla Smith represented Dublin; and Dr. Christison, Dr. Maclagan and Dr. A. Wood represented Edinburgh. This Pharmacopœia was published in London in 1864.

Mr. Squire, believing that an International Pharmacopœia might some day be brought about, published what he called 'The Companion to the British Pharmacopœia' and in this he compared the formulæ of the British with similar preparations found in the Austrian, Belgian, French, Prussian and United States Pharmacopœias and also with the former Pharmacopœias of London, Edinburgh and Dublin.

The success of this book induced Mr. Squire to apply the same idea to the Pharmacopœias of the principal hospitals of London. He accordingly collected and published these, classifying their formulæ for ready comparison. This book was published under the title of 'The Pharmacopœias of the London Hospitals.'

As an instance of the activity of mind which Mr. Squire retained up to the very end of his long life, it may be mentioned that a few months before his death he was engaged in studying the best method of preserving the freshwater medusæ found in the "Victoria Regia tank" at the Botanical Gardens, and communicated the result of his investigations in a paper which was read (July 9, 1883) before the Royal Microscopical Society.

We understand that the primary cause of Mr. Squire's death was congestion of the lungs, resulting in exhaustion. The funeral will take place in Kensal Green Cemetery, on Saturday, the 12th inst., at two o'clock.

ANSWERS TO CORRESPONDENTS.

J. Strachan.—We should think the stronger the better.

An Apprentice.—The name is apparently a fancy one, and is probably not intended to favour the identification. If you will send a portion of the "root," we will try and find out something as to its origin.

Antiseptic.—We do not know the preparation. An analysis would furnish you with the information you require.

Pharmacist.—Although agreeing with much that is contained in your letter, we are not prepared, in face of the fact that a similar experiment to that suggested by you has been already tried in this country and failed, to undertake to recommend its repetition at present. At any rate it would be prudent to wait and see the result of the effort now being made on the other side of the Atlantic.

A Correspondent from Dufftown.—The growth consists of *Merulius lachrymans* and *Lentinus lepideus*.

"*Amicus.*"—Put half the yolk of one egg with the acetic acid and turpentine into a 6-oz. bottle; shake well at intervals three or four times.

Correspondence.

The New Premises in Edinburgh.

Sir,—In reading over the report of the meeting of Council in the Journal of the 5th inst., I was very pleased to find the unanimity prevailing regarding the purchase of premises for the North British Branch in Edinburgh. The rooms at present are very good, but I feel sure that the Scotch members will be delighted to hear that scientific pharmacy is about to obtain "a habitation and a name" in the Scotch metropolis.

I do hope the membership will increase, and would suggest that a special donation might be asked from members of the trade in Scotland to defray part of the expense in fitting up the new premises.

What could be more delightful or profitable for country members than a stroll through the Pharmaceutical Society's premises when in Edinburgh? I hope some demonstration will take place at the opening and give the new premises a start. St. Rule.

The Position of Pharmacy.

Sir,—Mr. Hart tries to be witty at my expense. Well, I hope it pleases him, for it does not hurt me, and if he is happy I am content.

However, I am not going to descend to personalities either with him or any one else over this matter.

I entirely deny that there is any inconsistency between my first letter and any of the subsequent ones; what I wrote then I still maintain, and no one has yet attempted to dispute my statements or to deny their truth; whilst everybody who has written on the subject cries out against the Council with some pet grievance of his own, but leaves my allegations entirely unanswered.

I hope I am not so blinded by prejudice as not to see how much both pharmacists and non-pharmacists owe to the Society, nor so devoid of justice as to be unwilling to acknowledge it, and if I am in consequence to be charged with vacillation and inconsistency, I am well content to bear the imputation.

Cheetham Hill, Manchester. W. Wilkinson.

Sir,—The other evening, during the hour that intervenes between business and bed, I had been reading the correspondence which Messrs. Wilkinson and Co. have recently carried on in your columns, until wearied at last with the shop and all its belongings I laid down my Journal and took my Tennyson from his shelf. Instinctively I turned to that delicious picture of the lotus eaters, delicious indeed to a poor toiling druggist! and endeavoured to lap myself in its fancied Elysium. But your correspondents' baleful influence was strong upon me and would not be shaken off. The terrible pharmaceutical suggestions of the verse—

"And from the craggy ledge the poppy hangs in sleep"

completed the mischief, and from that point onwards Tennyson and Wilkinson, lotus land and the dispensing department, became inextricably mixed in my consciousness. I could not even recover myself to take in the loveliness of—

"The crisping ripples on the beach,
And tender curving lines of creamy spray."

But gradually I became more and more involved in confusions and uncertainties, until at length the words danced like demons over the page in the most fantastic combinations, and I read—or seemed to read—some such cross-bred doggerel as this—

"Let us swear an oath and keep it; let the Council find
We'll keep up no Society (whate'er the cause assigned)
While they live like gods together, careless of their kind.
For they sit and talk in London, and their napkins are unfurled
At their pharmaceutic banquets, and their lips are lightly curl'd,
Naturally, at us 'poor devils' in this lower world.
While they smile in secret, looking over wasted lands,
Stores and groceries, joint-stock companies, borough analysts' demands,
Doctors' raids, unscheduled patents, closing shops, and praying hands.
For they smile, they find a music, centred in a doleful song,
Steaming up, a lamentation, and an ancient tale of wrong;
Like a tale of little meaning, though the words are strong;
Chanted from an ill-used race of men who vilely toil,
Pass exams., yet unprotected after mickle moil
Spend fourteen hours a day 'dispensing' horse-balls, paints, and oil,
Till they smash, and so they're done for—some, 'tis whispered, bolt as well,
Others as assistants languish, and a few, oh! strange to tell,
Get a ten-pound note per annum from the Fund they helped to swell.
Surely 'tis a bitter ending, after all that went before,
Pounding pills, and spreading blisters, and 'the bums' when all is o'er;
Then, hark ye, brother pharmacists, let us subscribe no more!"

Here, sir, the climax of the absurdity (for which, believe me, your correspondence columns are alone to blame) awoke me; and I hastened to write out a cheque for a guinea in favour of Mr. Bremridge for fear I should longer forget that my annual subscription was overdue.

C. C. Bell.

The Antipodes.

Sir,—Can any reader of the Journal furnish information as to the prospects of pharmacists at the antipodes? In view of the fact that the increase in the number of chemists on the register is out of all proportion to the increase of population, and with the "stores" spectre turning our dreams of success in business into dismal nightmares of anticipated failure, it appears to me that some of us, who are young and strong, cannot do better than take Lord Derby's advice, and, for the sake of our fellows as well as for our own sakes, try to find employment for our brains and muscles in another country. Two of us (both qualified, and with small capital), intend going to Australia or New Zealand in the autumn. But 12,000 miles is a long way to go "on spec." Perhaps some reader of the journal can tell us whether there is plenty of business to be done, and whether the remuneration is good. Is trade so very different to that in this country? Would it be better to take situations as assistants, or start at once on our own account?

Believing, Sir, that replies to these questions will be read with much interest by very many assistants, I ask with confidence that you will allow them to be inserted.

Inquirens.

Eucalyptus Oil.

Sir,—In a recent issue of the Journal I noticed a paragraph under "The Month" in which it is stated that eucalyptus oil of the kind that has been in the market for some years is obtained from *Eucalyptus globulus*; this is an error, and one that I have endeavoured to get the wholesale trade at all events to give up.

Eucalyptus oil was first distilled by Dr. Bosisto, of Melbourne, some twenty years ago, from the *Eucalyptus amygdalina*, which is as distinct from *E. Globulus* as *M. Piperita* is from *M. sativa*, and is an entirely different oil from that obtained from the *E. Globulus*.

The success which Dr. Bosisto's oil has met with has induced people, having no knowledge of the different kinds of *Eucalyptus*, or gum-trees as they are called in Australia, to distil any oil from the leaves gathered indiscriminately from one or any of the forty or more *Eucalypti* growing in the Australia bush, and consequently have obtained an oil totally different from Dr. Bosisto's.

Some two years ago Dr. Bosisto distilled an oil from *E. dumosa*, or, as it is known in Australia, the mallee scrub. This oil differs slightly from the *amygdalina* in perfume, but Dr. Bosisto is of opinion that medicinally its properties are the same.

The *E. Globulus* is the tree that has a great power of absorbing moisture from the earth and passing it off by its leaves into the air, and has hence been largely planted in malarial districts. The introduction of this tree into Europe (at Rome, etc.) has doubtless been the source of the constant confusion as to the origin of Dr. Bosisto's well-known oil.

82, *Bishopsgate Street, E.C.* E. H. Grimwade.

Communications, Letters, etc., have been received from Messrs. Schacht, Moore, Howe, Jumbo, Assistant.

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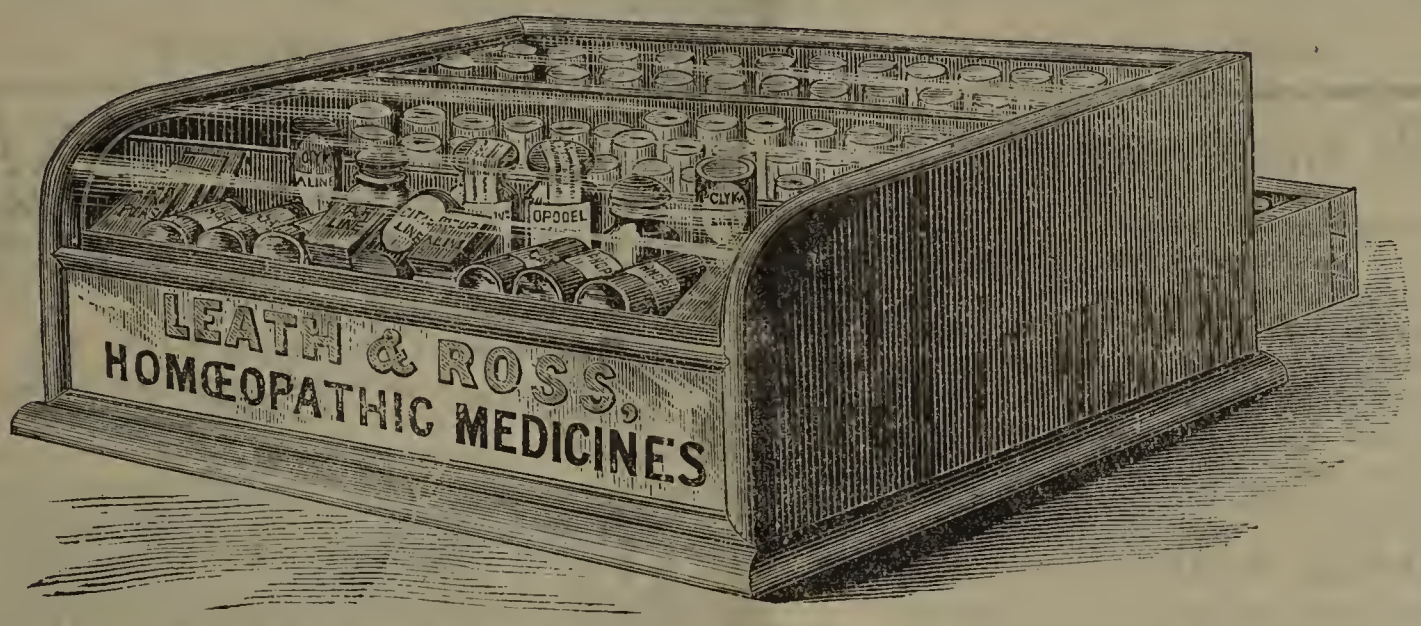

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They never crack or split. The coating does not peel off. They are moderate in price. The Ingredients are carefully selected, and of best quality. The coating, which dissolves in about half a minute, is put on while the mass is soft, thus keeping the Pill in a perfectly soluble condition. It is unimpaired by age, is quite transparent, and the taste of the Pills is perfectly covered. The excipients chosen tend to preserve the soluble character of the Pill, and increase the medicinal effect of the drug.

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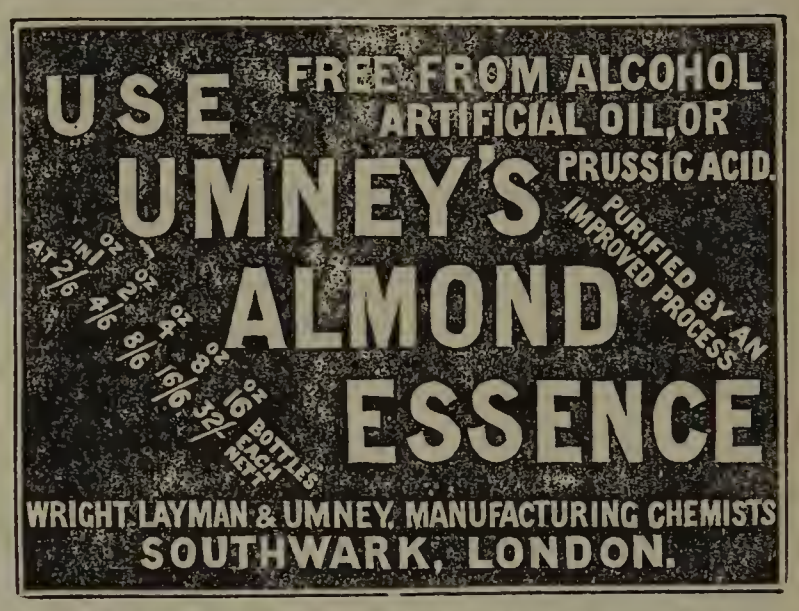

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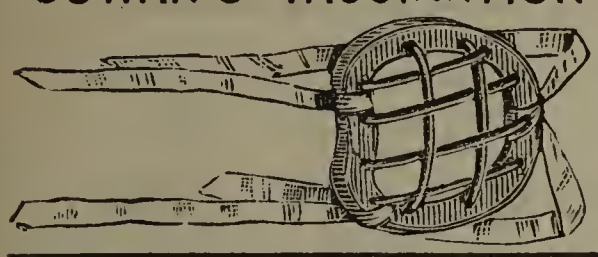

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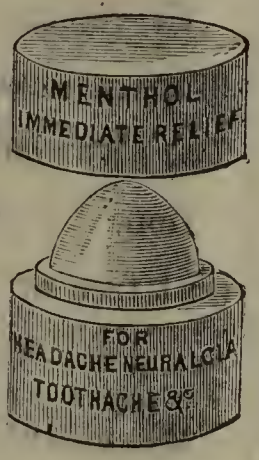

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CRANMER GELL, Secretary.

Committee Room, Temple Row, Birmingham,
April 3rd, 1884.

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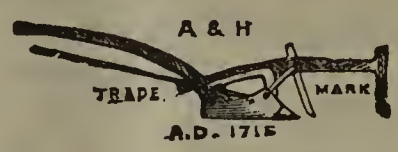

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 721.] SATURDAY, APRIL 19, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

SPECIAL NOTICE.

Wednesday, April 30th, is the last day on which the Secretary can receive Subscriptions.

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SECTION 1, CLAUSE 10—"All Subscriptions for the Current Year shall become due upon election, and *all Annual Subscriptions shall become due on the first day of January in every year*; and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the first day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society, certified by the Council at the Annual Meeting."

SECTION 17, CLAUSE 3.—"Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the Certificate or Diploma of Membership, if any, held by him. *No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the Certificate or Diploma of Membership, if any, shall have been returned.*"

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FOR 1884.

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Guaranteed to contain the proportion of Nitrous Ether directed by the British Pharmacopœia.

Æther Nitrosus and Sol. Ætheris Nitrosi

Respectively 8 and 4 times the strength of the Spirit.

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Distilled from Volcanic Ammonia.

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This is a finely granulated preparation, which in dissolving produces a sustained sparkling effervescence, and a clear, bright solution. It possesses all the advantages of an agreeable saline, combined with the anti-febrile properties of Chlorate of Potash, of which it contains a considerable percentage. It is, in short, an efficient aperient and febrifuge, and makes an exceedingly pleasant and refreshing beverage.

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4 oz. Jars	,,	6/7	,,		19/9
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"We have had opportunities ourselves of testing the worth of this Quinquinine, and have examined the testimony of numerous medical men in its favour. It is a good tonic and agrees with the stomach better than the old Sulphate of Quinine."

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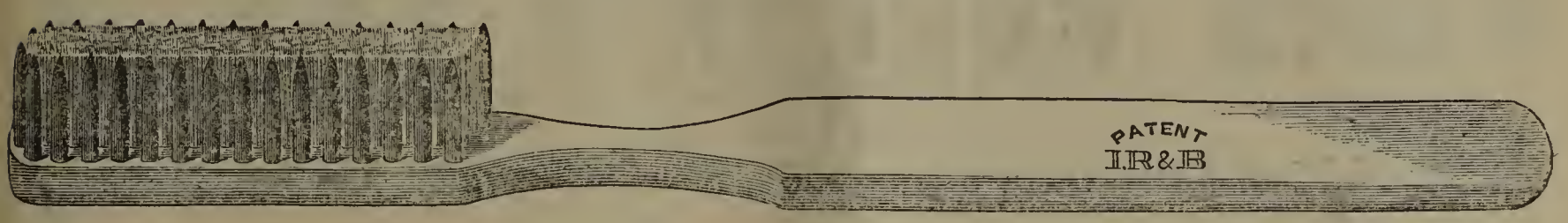

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From *The Journal of the British Dental Association,* January 15, 1884.

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We have received from Messrs. Maw & Co., of Aldersgate Street, specimens of a new pattern tooth-brush, with the above designation, which they are about to bring under the notice of the profession. The initials refer to the "India Rubber and Bristles," of which the brushes are composed. They consist of a narrow bristle brush of the ordinary type, surrounded by a single row of stems of soft red rubber of nearly the same length. They are both efficient and pleasant to use, and we should anticipate that the superior durability and elasticity of the rubber will afford so much support to the bristles as to keep them in shape and working order for a much longer time than an equally soft ordinary bristle brush would wear. The chief object of the rubber addition is, however, to prevent abrasion of the gums, and it appears to answer this purpose very satisfactorily. To persons with tender, or partially edentulous mouths, brushing the teeth is an unpleasant and even painful operation; Messrs. Maw's brushes will certainly reduce the discomfort in such cases to a minimum.

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[*Syrup. Ferri Phosph. Comp.* (*Squire*).]

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Properties. It is a complex solution of IRON, LIME, SODA, and POTASH, in a PHOSPHORIC SYRUP (*containing the Iron in the Ferrous condition*). It thus contains no single substance which is not a constituent of the blood and tissues, and therefore may be administered daily for a lengthened period.

Uses. Physicians have prescribed it for the last twenty years more extensively than any other preparation of the kind. They have found it useful in a great variety of maladies, and especially suitable as an addition to the diet of delicate children, and in all cases of pallor and general weakness in adults as well as children.

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In order to popularize it and place it within the reach of everyone, it is now (in addition to being put up in champagne bottles as heretofore) also put up in ordinary mineral water bottles and supplied to the trade on such favourable terms as will enable them to retail it at the same price as lemonade.

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APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hprs. free. 5 % discount if 20. Carriage paid.

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SELTZER ..	11/-	Hpr.,	25 bots.
,, ..	15/-	Hpr.,	50 ½-bots.
PULLNA ..	18/-	Case,	20 bots.
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VICHY ..	31/-	,,	50 bots.
,, ...	27/-	,,	50 ½-bots.
CARLSBAD ..	37/-	,,	50 bots.
KISSENGEN ..	42/6	,,	50 ,,
SCHWALLBACH	27/6	,,	50 ,,
HOMBURG ..	40/-	,,	50 ,,
WILDUNGEN	43/-	,,	50 ,,

ENTERED AT STATIONERS' HALL.

CARLSBAD SALTS, ¼-bots., 20/- per doz.; ½-bots., 40/- per doz.; bots., 80/- per doz.

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BLOCK ICE.

Original Blocks, 2s. per Cwt.

Packing and Mats free.

Low quotations given for quantities taken from vessels while discharging.

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IMPORTER of ICE and MINERAL WATERS,

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SPIRITS OF WINE CHEMICALLY PURE

The Best English Grain Spirit, free from Fusel Oil.

56 over proof, 19/7 net, prompt Cash, for 5 gallon quantities; also Finest Orange Wine and Sherry for medicinal purposes.

CALE STREET DISTILLERY, LONDON, S.W.

Duty free for Exportation—also best Methylated Spirit at lowest prices.

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Toilet or Curling Paper and Fixture

SHOULD BE IN EVERY HOUSEHOLD.

THIS Paper is strongly recommended for Family and Hotel use, combining, as it does, great economy and neatness, with protection to health. No stoppage of Drain Pipes. Once tried always continued. Gives great satisfaction.

Roll of Paper containing 1000 Sheets, and Nickel Revolving Holder, complete	2/6
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SOLUBLE ESSENCES FOR AERATED WATER,

DOUBLE THE STRENGTH OF ORDINARY SUPER QUALITIES.

W. J. B. & CO. caution the trade against the so-called soluble Essences now so frequently offered for sale, which are nothing more than mere tinctures, and, although offered at lower prices, cost five or six times as much in use, whilst imparting a strong medicated flavour.

The importance of our invention of Soluble Essence is clearly shown by the numerous imitators and copyers that have sprung up, and we must inform the Trade that ours are the only **Genuine Original Soluble Essences.**

FRENCH CREAM GUM EXTRACT.

Protected by Royal Letters Patent. For producing a head of creamy richness upon all kinds of

Syrups, Aërated Waters, Beers, Ales, Cider, &c.

W. J. BUSH & CO. regret having to caution the trade against spurious imitations of this article, most of which being mere rubbish.

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ENGLISH DRAWN ESSENTIAL OILS

OL. AMYGD. ESSENT. ANG.
" AMYGD. " (SINE ACID. PRUSSIC)
" ANETHI ANG.
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" CINNAM. VER. ANG.
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" SASSAFRAS ANG.
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OL. LIMONIS (*W. J. B. & Co.'s Speciality*).

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED) LONDON."

Since the introduction of Pepsine by BOUDAULT and Dr. L. CORVISART, BOUDAULT'S Preparations have been considered the most reliable.

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The Jury of the International Exhibition, Paris, 1867, awarded to BOUDAULT'S Preparations the *only* Medal given for Pepsine. Since that time it has taken the Medal at each of the International Exhibitions—Havre, Lyons, Vienna, Philadelphia, and Paris, 1878.

BOUDAULT'S PEPSINE—dose, 5 to 10 grains—in bottles, one ounce, 5/-; in bottles, half-an-ounce, 3/-
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CAN BE HAD OF ALL CHEMISTS.

KILNER BROTHERS,

Glass Bottle Manufacturers,

10, Gt. Northern Goods Station

KING'S CROSS, LONDON,

Invite the attention of Chemists and others to the large variety of Glass Bottles, &c., that they supply, and solicit orders for same.

DISPENSING.—Green and White Flint, of all sizes and shapes.

PERFUMERY.—White Flint, in different styles.

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GOLD MEDAL, ADELAIDE, 1881.

Joseph Pickering & Sons, Albyn Works, Sheffield.

Dispensing Bottles and Phials, made of Pure Metal. **I. ISAACS & CO.**, Glass Bottle Manufacturers, beg to state that they have *greatly improved the quality of their Bottles*, and supply them at the following greatly reduced prices—

Green FLINT, Flat or Oval, Plain or Graduated.

3 and 4 ounce	8s. 0d.	per gross.
6 „ 8 „	8s. 6d.	„
12 „	13s. 0d.	„
16 „	16s. 0d.	„

White Moulded Phials of Superior Quality.

½ ounce and under	4s. 0d.	per gross.
1 ounce	4s. 6d.	„
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2 „	6s. 0d.	„
3 „	7s. 6d.	„

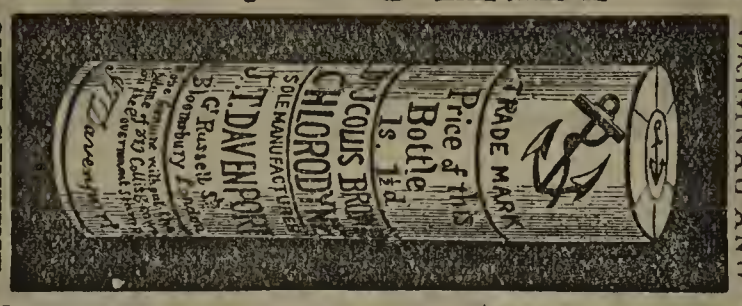
Plain or Graduated to Teaspoons.

All the above are first rate quality. In ordering, please say "*pure Metal Bottles.*" A Sample Bottle of any kind forwarded free on application. Country packages, 1s. each. Bankers, London and Westminster. Established upwards of 50 years.

I. ISAACS & CO., Glass Bottle Manufacturers, 25, Francis Street, Tottenham Court Road, London.

THE ORIGINAL AND ONLY GENUINE.

DR. J. COLLIS BROWNE'S CHLORODYNE



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IS THE GREAT SPECIFIC FOR CHOLERA, DYSENTERY.

COUGHS, COLDS, ASTHMA, BRONCHITIS.

DIARRHŒA,

DR. J. COLLIS BROWNE'S CHLORODYNE.—Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY to denote which he coined the word CHLORODYNE. Dr. Browne is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

GENERAL BOARD of HEALTH, London, REPORT that it ACTS as a CHARM, one dose generally sufficient.

Dr. GIBBON, Army Medical Staff, Calcutta, states: "2 DOSES COMPLETELY CURED ME of DIARRHŒA."

From SYMES & Co., Pharmaceutical Chemists, Simla. *Jan.* 5, 1880.

To J. T. DAVENPORT, London.

DEAR SIR,—We congratulate you upon the widespread reputation this justly-esteemed medicine has earned for itself all over the East. As a remedy of general utility, we much question whether a better is imported, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances *ad infinitum* of the extraordinary efficacy of DR. COLLIS BROWNE'S CHLORODYNE in Diarrhœa and Dysentery, Spasms, Cramps, Neuralgia the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than Collis Browne's, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than Collis Browne's is a deliberate breach of faith on the part of the chemist to prescriber and patient alike.—We are, Sir, faithfully yours, SYMES & CO., *Members of the Pharm. Society of Great Britain, His Excellency the Viceroy's Chemists.*

DR. J. COLLIS BROWNE'S CHLORODYNE is the TRUE PALLIATIVE in NEURALGIA, GOUT, CANCER, TOOTHACHE, RHEUMATISM.

DR. J. COLLIS BROWNE'S CHLORODYNE is a liquid medicine which assuages PAIN of EVERY KIND, affords a calm, refreshing sleep WITHOUT HEADACHE, and INVIGORATES the nervous system when exhausted.

DR. J. COLLIS BROWNE'S CHLORODYNE rapidly cuts short all attacks of EPILEPSY, SPASMS, COLIC, PALPITATION, HYSTERIA.

IMPORTANT CAUTION.—The IMMENSE SALE of this REMEDY has given rise to many UNSCRUPULOUS IMITATIONS. Be careful to observe Trade Mark. Of all Chemists. 1s. 1½d., 2s. 9d., and 4s. 6d.

SOLE MANUFACTURER,
J. T. DAVENPORT, 33 Gt. Russell St., W.C.

IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

Apothecaries' Hall	London.	Gale & Co.	London.	Morson, T., & Son,	London.
Allen, Hanbury & Co.	,,	Giles & Son,	Clifton.	Newbery & Sons,	,,
Baiss Brothers,	,,	Goulding, Messrs.	Cork.	Oldham, G., & Co.	Dublin.
Banks & Richards,	Birmingham.	Grattan & Co.	Belfast.	Parsons & Richardson,	Leicester.
Barron, Harveys & Co.	London.	Grimwade, Ridley,	London.	Peake, Allen & Co.	Dublin.
Bell, John & Co.	,,	Grindley & Son,	Chester.	Raimes & Co.	Liverpool.
Corbyn & Co.	,,	Hearon, M'Culloch & Co.	London.	Sang & Barker,	Edinburgh.
Cox & Gould,	,,	Hodgkinson, Tonge & Stead,	,,	Sanger, J., & Sons,	London.
Curling & Co.	,,	Hopkins & Williams,	,,	Sim, James, & Co.	Aberdeen.
Davy, M'Murdo & Co.	,,	Hovenden, R. & Sons,	,,	Smeeton, W.	Leeds.
Drew, Barron & Co.	,,	Johnson, J. H., & S.	Liverpool.	Southall & Co.	Birmingham.
Drew, B., & Alexander,	,,	Langton, W., & Co.	London.	Sutton, W., & Co.	London.
Dunn & Company,	,,	Lynch & Co.	,,	Tomlinson, Hayward & Co.	Lincoln.
Edwards, W.	,,	Mackay, John, & Co.	Edinburgh.	Treacher, Hodgkinson & Co.	London.
Evans, Lescher & Webb,	,,	Mander, Weaver,	Wolverhampton.	Westwood & Hopkins,	,,
Ferris & Co.	Bristol.	Marsden & Sons,	London.	Woolley, James,	Manchester.
Foulger, S., & Son	London.	Maw & Son,	,,	Wyleys & Brown,	Coventry.
Frazer & Green	Glasgow.	Meggeson & Co.	,,	Yates & Co.	London.

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith, unjust to patient and physician. The *value* of the remedy *alone* creates the great demand.

Sold in Bottles—1s. 1½d., 2s. 9d., 4s. 6d., and 11s. Usual Discount to the Profession.

SOLE MANUFACTURER,

J. T. DAVENPORT, Pharmaceutist, 33, Gt. Russell St., Bloomsbury Sq., LONDON.

THE ORIGINAL AND ONLY GENUINE.

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(W. G. Baker, R. C. Heath, T. Tyrer, W. E. B. Blenkinsop),

MANUFACTURING CHEMISTS,

BATTERSEA, LONDON, S.W.

Medals--1851, 1855, 1862, 1867.

WHOLESALE AND EXPORT ONLY.

MERCURIALS

BISMUTH PREPARATIONS.

PURE **ETHERS** METHYLATED.

BENZOIC ACID AND BENZOATES

AMMONIA.

FRUIT ESSENCES AND FLAVOURS.

TABLET CAMPHOR

SUBLIMED ANY SIZE

UNIFORMLY THICK & TRANSPARENT

METACETALDEHYDE.*

(METALDEHYDE.)

BY WYNDHAM R. DUNSTAN,

Assistant Lecturer in Chemistry and Physics to the Pharmaceutical Society and Demonstrator of Practical Chemistry in the School of Pharmacy.

My attention was recently directed by the excellent Curator of the Pharmaceutical Society's Museum, Mr. Holmes, to some crystals which had been found in a bottle of acetaldehyde. They had been presented to the Museum by Messrs. Morson, and were supposed to be aldehyde-ammonia. The white opaque crystals, which formed fairly well-defined quadratic prisms, were quite permanent in the air and had no odour; they were easily powdered, and the powder at first emitted an odour which somewhat recalled peppermint, but after being exposed to the air for some hours was quite odourless. When heated the crystals sublimed near 100° C. without previously melting, forming a flock-like network of needle-shaped crystals, the condensation of the vapour taking place but a very short space above the source of heat; in fact, when a crystal is heated on platinum foil it burns with a non-luminous flame, and if the foil be quickly withdrawn from the source of heat, and the flame blown out, the vapour at once condenses upon the remaining portion of the crystal, forming a beautiful coating of silky needles. The crystals were insoluble in cold and hot water, and also in cold alcohol. Boiling alcohol dissolved them, and on cooling the solution, fine needle-shaped crystals were deposited. The crystals were also soluble in boiling ether and chloroform. Sulphuric, nitric and hydrochloric acids had no effect upon the substance in the cold. Warm sulphuric acid dissolved the substance, at the same time evolving a vapour smelling like acetaldehyde. Warm nitric acid powerfully oxidized the body with copious evolution of nitrous fumes; acetic acid was found in the resulting liquid. Hot hydrochloric acid also dissolved the crystals. The crystals contained no nitrogen. The combustion of the body with lead chromate yielded the following results:—

	Found.		Calculated for
	I.	II.	C_2H_4O.
C. . .	53·4	54·3	C. . . 54·54
H. . .	9·3	10·0	H. . . 9·09
O. . .	37·3	35·7	O. . . 36·37
	100·0	100·0	100·00

These figures, taken in conjunction with the physical and chemical properties that have been described, indicated that the crystals were *metacetaldehyde*† $(C_2H_4O)_n$, the solid polymer of ordinary aldehyde and the congener of paracetaldehyde, which has so lately been introduced into medicine as a hypnotic. When metacetaldehyde is heated it partially dissociates into acetaldehyde, and for this reason it has not been possible to determine its molecular weight and hence its two-volume formula is unknown. Judging from physical properties the molecular weight is probably higher than that of paracetaldehyde ($C_6H_{12}O_3$).

In addition to the reactions already mentioned, the following have been observed, and, as far as I am aware, have not been noticed by previous experimenters—Liebig, Fehling, Weidenbusch, Kekulé and Zincke, Pinner and Krämer. Metacetaldehyde in alcoholic solution does not reduce an ammoniacal solution of silver nitrate and is thus distinguished from acetaldehyde.

Metacetaldehyde is very slowly acted upon by a hot strong solution of potash, yielding "aldehyde resin." When a mere trace of metacetaldehyde is brought in contact with phenol dissolved in excess of sulphuric acid (phenol sulphonic acid) a fine scarlet colour is produced, which changes to a dark red when the mixture is warmed. The reaction is extremely delicate and is also given by acetaldehyde. Many other aldehydes (benzoic, cinnamic, cumic, formic, etc.) give this reaction with phenol sulphonic acid in a more or less marked degree. Oil of cinnamon (cinnamic aldehyde), in very minute quantity, gives a deep scarlet colour, which changes through deep red and violet to a greenish blue. When the crystals of metacetaldehyde are heated in a sealed tube to 130° C. for a few hours a liquid is formed which mainly consists of acetaldehyde. Metacetaldehyde is dissolved by boiling paracetaldehyde and to less extent by boiling acetaldehyde. When these solutions are cooled the metacetaldehyde is deposited in needles. Hot hydrochloric acid is capable of dissolving a large quantity of metacetaldehyde which is thereby depolymerized and converted into acetaldehyde. When the acid liquid is diluted with water and neutralized, it gives the reactions of acetaldehyde with great distinctness. This is the readiest method of depolymerizing metacetaldehyde.

I have prepared metacetaldehyde by the action of sulphurous acid upon acetaldehyde at 0° C., and have found that the crystalline body thus obtained agrees in its properties with the crystals now under consideration. The formation of these crystals in the bottle of aldehyde was in all probability induced by the use of calcium chloride for dehydrating the original aldehyde. This substance is known to exert a polymerizing action upon acetaldehyde; in fact, when a piece of calcium chloride is placed in acetaldehyde it becomes covered with crystals of metacetaldehyde. When metacetaldehyde is slowly deposited at normal temperatures from a solution in ordinary aldehyde (acetaldehyde) it appears to form quadratic prisms, but when produced by the action of sulphuric acid at 0° C. it is deposited in needles. It has already been noticed that the quadratic prisms are resolved into needles when sublimed, or when dissolved in boiling alcohol and the solution cooled.

The physiological action of metacetaldehyde has not yet been studied. It would, however, seem worth while to investigate it, for the substance can easily be obtained in a state of great purity, and has no unpleasant taste; in fact, is practically tasteless. If it should be found to have a powerful hypnotic action metacetaldehyde will probably supersede both chloral and paracetaldehyde in medical practice. I found that no hypnotic effect ensued from the administration of about seven grains of the substance, but intense salivation was produced.

My best thanks are due to Mr. Walter H. Ince for his assistance, especially in preparing some of the experiments to illustrate this report.

* Report upon Organic Chemistry. Read at a Meeting of the School of Pharmacy Students' Association, March 27, 1884.

† The polymers of acetaldehyde are commonly termed paraldehyde and metaldehyde, but as aldehydes other than acetaldehyde yield similar compounds, these bodies are more appropriately termed paracetaldehyde and metacetaldehyde, indicating their formation from acetic aldehyde or acetaldehyde.

THE MATERIA MEDICA OF THE NEW PHARMACOPÉE FRANÇAISE.

(*Continued from page* 758.)

C.

The following are now omitted:—Caïlcedra bark (*Khaya senegalensis*); Caïnca root (*Chiococca anguifuga*, Mart.); *Anthemis Cotula*, *Camphorosma monspeliaca*, L.; Cassia flowers and oil of cassia; the barks of *Cinnamomum Culilawan* and *Dicypellium caryophyllatum*; Safflower flowers and fruit; *Nepeta Cataria*, L.; Citron fruit and oil; Greater Centaury (*Centaurea Centaurium*, L.); Sweet Chervil; Greater Celandine; Woodlice; the root of *Cyclamen europæum*, and Cypress cones (*Cupressus sempervirens*, L.). The synonym for Capsicum, "Corail des Jardins," is also omitted as a cross reference.

Alterations have been made in the following instances:—

Cachou de Pegu or Caschutie.—The official catechu is now limited to the extract of *Acacia Catechu*, W., and *A. Suma*, Kurz.

Cade, Huile de.—The botanical source is still given as *Juniperus Oxycedrus*, L., although, according to the authors of 'Pharmacographia,' there is no proof that it is now yielded by that species, the crystals found in the tar obtained from that plant, being absent in the commercial article.

Cajeput.—*Melaleuca Leucadendron*, L., is now adopted as the botanical name, instead of *M. minor*.

Camphre du Japon is now removed to the second class of chemical preparations, probably because the drug is always used in the refined, and not in the crude state.

Caoutchouc is now described as being obtained from *Castilloa elastica*, Cerv., *Hevea guayensis*, *H. Spruceana*, *H. brasiliensis*, some species of *Moraceæ*, and American or African Apocynaceous species, belonging to the genera *Hancornia* and *Vahea*.

Capillaire.—The directions for distinguishing between the Capillaire du Canada (*Adiantum pedatum*, L.) and Capillaire du Montpellier (*A. Capillus-Veneris*, L., are now omitted.

Cevadille.—The seed as well as the fruit are now official. *Schœnocaulon officinale*, A. Gray, is adopted as the botanical name of the plant.

Chene.—The bark of *Quercus Ilex*, L., is now official, as well as that of *Q. pedunculata*.

Cochenille.—The word "femelle" is omitted.

Colchique.—Colchicum corm was described in the last edition as a "tubercule bulbiforme;" now it is described as a "bulbe," a term not usually applied to colchicum in this country.

Colombo.—*Chasmanthera palmata*, H. Bn., is now adopted as the botanical name for the plant, but *Jateorhiza palmata*, Miers, is given as a synonym.

Colophone or Arcanson.—This is not now limited to the resin obtained from *Pinus maritima*, but is described as the product of different species of Coniferæ.

Concombre sauvage.—*Ecbalium Elaterium*, A. Rich., is given as the name of the plant, and *Momordica Elaterium*, L., as a synonym.

Copahu.—*Copaifera coriacea*, Mart., is added to the species mentioned in the last edition as yielding the drug.

Courge potiron.—The seeds are now only to be obtained from *Cucurbita maxima*, Duch.

Cousso.—*Hagenia abyssinica*, Lam., is now adopted as the botanical name, and Bruce's name, *Banksia abyssinica*, dropped.

Curari.—The poison is now said to be principally obtained from *S. Castelnœana*, Wedd., the production of the region of the Upper Amazon. (See *Pharmaceutical Journal*, [3], xi., p. 492.)

Curcuma long et rond.—*C. longa*, L., is now given as the botanical name, in place of *C. tinctoria*, Guib.

The drugs marked with an asterisk under "C." are Catechu, Roman Camomile, *Canne de Provence* rhizome, (*Arundo donax*, L.), Cinnamon, Cantharides, Canadian Maidenhair, Malabar Cardamoms, Carragheen, Cassia fistula, Hartshorn, Castoreum, lesser Centaury (*Erythræa Centaurium*, L.), *Chardon bénit* (*Centaurea benedicta*, L.), Chicory root, Hemlock, Wax, Calumba, Colophony, Colocynth, *Consoude grande* (*Symphytum officinale*, L.), Copaiba, *Coquelicot* (*Papaver Rhœas*, L.), Coriander, Cousso, Croton seeds, Cubebs and Cummin.

D.

The only alterations under "D." are the introduction of dita bark and directions under digitalis for distinguishing it from the leaf of *Inula Conyza*. The tests given are that the lateral veins are at an oblique angle to the midrib in *Digitalis*, and that the infusion treated with ammonia does not give the green coloration characteristic of the infusion of *Inula Conyza*.

E.

The following are now omitted:—*Veratrum album*, Estragon (*Artemisia Dracunculus*, L.), *Euphrasia officinalis*, L. *Helleborus niger* and *H. viridis*, are now placed under "H," as *Hellebore blanc* and *Hellebore noir*.

Elemi.—Other varieties of Elemi beside the Brazilian are now admitted in the following terms:—"Résine extraite de diverses espèces de Burseracées d'Amérique et de Manille, principalement (?) du *Canarium commune*, L." This sentence, to say the least, is very ambiguous, and the last four words might well have been omitted.

Encens, Oliban, is now mentioned under the first of these names, and is correctly attributed to *Boswellia Carterii* and *B. Bhau-dajiana*, Birdw., although both the specific names are printed incorrectly.

Eponge fine.—*Spongia usitatissima* as well as *S. officinalis* is now given as a source of sponge.

Erysimum, Vélar, Tortelle, Herbe aux chantres (*Sisymbrium officinale*, DC.), is now given under the first instead of the second name. Here, again, a printers' error has not been corrected in "Sysimbrium."

Escargot or Limacon des Vignes.—The remark that *Helix aspersa* and *H. vermiculata* are used in the south is now omitted.

Euphorbe (Gomme resine d') is now referred to *Euphorbia resinifera*, Berg.

The only addition under "E" is the *Eucalyptus globulus*, Lab., of which the leaves only are official.

F.

The only alterations under this head are the addition of potato starch, and the change of the name of *Ignatia amara* to *Strychnos Ignatii*, Benth., and that of the ash tree from Frêne élevé to Frêne.

G.

The articles omitted are Chinese galls, Gambier, Genêt purgatif (*Genista purgans*, L., and *G. tinctoria*,

L.), Ginseng and Grenouille (*Rana esculenta*, L.). Gélatine animale has been removed to the Pharmacie Chimique division, and Graisse de porc to Pharmacie Galénique, where it may be found under the name of Axonge.

GALANGA OFFICINAL; GALANGA DE LA CHINE, PETIT ET MOYEN.—This rhizome is now rightly referred to *Alpinia officinarum*, Hance.

GALBANUM.—This is now stated to be probably the product of *Ferula galbaniflua*, Boiss. et Buhse, and *F. rubricaulis*, Boiss. The distinction of the drug as a dry and a soft galbanum is no longer made, nor is any description of its appearance given. This, however, is perhaps of little importance, as a process for its purification is given in the section devoted to Pharmacie Galenique, and a uniform consistence can therefore be obtained.

GALIPOT.—*Pinus Pinaster*, Sol., is the name now adopted in preference to that of *Pinus maritima*.

GALLE DE CHENE D'ALEP OU NOIX DE GALLE D'ALEP.—The oak yielding these galls is now made a variety; thus, *Quercus lusitanica*, Webb., var. *infectoria*.

GAYAC.—Guaiacum is now referred to *G. sanctum*, L., as well as *G. officinale*, L.

GOMME ADRAGANTE.—Tragacanth is now described as being derived from various species of *Astragalus*.

GOMME AMMONIAQUE.—*Peucedanum Ammoniacum*, R. Br., is given as a synonym of *Dorema ammoniacum*.

GOMME ARABIQUE VRAIE.—Is described as being friable and soluble in water. It is now referred to *Acacia Senegal*, W., and *Acacia Arabica*, W. Both of these species yield a gum, however, which can hardly be said to be friable, being usually hard and clear internally.

GOMME GOUTTE.—This is now correctly referred to *Garcinia Hanburii*, Hook.

GOMME DU SÉNÉGAL.—This is stated to give a viscous solution and to be obtained from several species of acacia, chiefly *A. Senegal*, W., *A. Seyal*, Del., and *A. Arabica*, W.

GRENADIER.—The remarks in the last edition under this drug are now omitted.

GUTTA PERCHA.—This is now attributed to *Dichopsis Gutta*, Thw., *Sapota Mulleri*, and other trees of the Sapotaceous family. The product of the last-named tree is known in commerce as Chicle gum. Dr. Beauvisage has recently shown that some of the gutta percha of commerce is produced by *Dichopsis Krautziana*, a name which might well have replaced that of *S. Mulleri*.

The only addition under "G" is Gland doux, the sweet acorn of *Quercus Ballota*, L.

H.

HOUX COMMUN (*Ilex aquifolium*), Huile de palme, and Huitre commune, L., are now omitted, and the only addition is *Hydrocotyle Asiatica*.

HYSSOPE is now referred to *Hyssopus officinalis*.

I.

INDIGO and the rhizome of *Iris fœtidissima*, L., are omitted. Ipecacuanha and iris root are marked with an asterisk.

ICTHOCOLLE OU COLLE DE POISSON.—*Acipenser ruthenus* and *A. vulgaris* are now given in addition to *A. Huso* as sources of isinglass, and all mention of E. Indian and S. American isinglass is omitted.

IRIS DE FLORENCE.—*Iris germanica* and *I. pallida* and "other species" are now mentioned as sources of orris root.

Peucedanum Ostruthium, Koch., is the name now accepted for *Imperatoire*, and *Uragoga Ipecacuanha*, H. Bn., is mentioned as a synonym for *Cephaëlis Ipecacuanha*.

J.

JACÉE DES PRÉS (*Centaurea Jacea*, L.) and JOUBARBE DES TOITS (*Sempervivum tectorum*, L.) are now omitted and Jaborandi has been added.

JALAP and *Hyoscyamus niger* are marked with an asterisk.

JABORANDI.—The leaves of *Pilocarpus pennatifolius*, Lem., and *P. Selloanus*, Eng., and allied species are official. As the leaves of *P. Selloanus* have been stated to contain less alkaloid than those of *P. pennatifolius*, and there exists no definite information of the strength of "allied species," the preparations (extrait, tisane, teinture, etc.) made from the drug are likely to vary considerably in strength.

JUSQUIAME.—The remark that the only henbane seed now to be found in commerce is that of *Hyoscyamus albus* is omitted.

K.

KERMÈS ANIMAL is omitted.

L.

LADANUM, LEQUE LIERRE COMMUN (Ivy) and the fruit and oils of Limes Lupin (*L. albus*) are omitted.

LACTUCARIUM is now acknowledged as being derived from several species, *L. virosa*, L., *L. sativa*, L., *L. Scariola*, L.

LAURIER-CERISE is now referred to *Prunus Laurocerasus*, DC.

M.

The following articles are omitted:—Malabathrum, Mandragore, Maniguette or graine de paradis, Marronier de l'Inde, Mélèze, Melisse de Moldavie (*Dracocephalum Moldavicum*, L.), Méum and Myrobalan citrin.

Those marked with an asterisk are Manne, Mauve (*Malva sylvestris*, L.), Melilot officinal, Melisse officinale, Menthe poivrée, Menyanthe, Mercuriale annuelle, Miel, Morelle (*Solanum nigrum*, L.), Mousse de Corse (*Alsidium Helminthocorton*, Kutz), Moutarde noir, Musc and Myrrhe.

The following alterations have been made:—

MARJOLAINE. — *O. majoranoides*, Willd., is no longer official, but only *O. Majorana*, L.

MAUVE.—*Malva glabra*, Desr., is now omitted, and *M. sylvestris*, L., is alone official under this name.

MAUVE PETITE.—This is now the official name for *Malva rotundifolia*, L., instead of Mauve à feuilles rondes, as in the last edition.

MENTHE VERTE.—*Mentha viridis* apparently replaces *M. crispa*, L., which is now omitted.

MOUSSE DE CORSE. —This is now referred to *Alsidium* (*Gigartina*) *Helminthocorton*, Lam.

MOUTARDE NOIR.—This is now referred to *Brassica nigra*, L., while Moutarde blanche is still referred to the genus *Sinapis*, and *S. nigra*, L., given as a synonym.

MUGUET.—The entire plant as well as the flower of the lily of the valley is now official.

MURE is now the official name for Mulberry, instead of Murier noir.

MYRRHE.—This is described as a gum resin exuding from different species of *Balsamodendron*, especially from *B. opobalsamum*, Kth. This is not correct, *B. opobalsamum* yields Balm of Gilead, as stated in the last edition of the work. See also *Pharm. Journ.*, [3], vol. ix., p. 893.

(*To be continued.*)

UNOFFICIAL INDIGENOUS MEDICINAL PLANTS.*

BY E. J. EASTES.

The object of this paper is not to describe some of those plants which, although excluded from our Pharmacopœias, are yet commonly employed by our regular practitioners, but it is intended to give a brief sketch of the more important of those plants which may be called domestic remedies, being such as are still in common use in country districts, and are still sold in towns and cities by herbalists, and medico-botanists, *i.e.*, dealers in and prescribers of both British and American herbs.

It is a fact that these common herbs have a great reputation with many people as being the best remedies for numerous ailments, and as a consequence the demand for them is also great, and the public must go to shops of some description to obtain them. As is well known not one chemist in a hundred keeps in stock such articles as comfrey, burdock, buckbean, yarrow, tansy, etc., therefore the people who use them must go to the herbalist for them. It seems to me that chemists, by so completely ignoring this branch of materia medica, are, in country districts at least, deliberately turning away many scores of customers, and that at a time when there is a universal cry about trade going down, and profits being cut excessively fine. For these things would bring a profit of at least fifty per cent., and customers once obtained would be almost certain to come again to the same shop. Looking at it from a higher standpoint also, many of these plants possess considerable activity, such as bryony, tansy, and purging flax, and although probably very useful if taken in proper quantities, in some cases an overdose might, and no doubt frequently does, produce unlooked-for and perhaps dangerous results. Therefore, who so proper to deal with them as the registered chemist, who has been examined in the very branches of science which bear upon the recognition, properties, and appearances of drugs; and who is expected to be able to manifest in his examination a knowledge of our indigenous medicinal plants.

If any of the members of this Association should ever be located in a country pharmacy, they will in all probability be asked for these articles. Certainly in a French pharmacy they would be expected to be familiar with their appearance and properties, a large number being included in the present French Codex.

I thought, therefore, that perhaps it might be interesting to show specimens and give brief descriptions of a few of the more important of them. For certainly this branch of our business seems to be worth the trouble of cultivating.

The specimens on the table were obtained from a genuine herbalist's shop not a hundred miles from Bloomsbury Square, and may, I think, be taken as fair samples of the drugs as usually sold. It was suggested to me by Professor Bentley that it would be interesting also to try and find out if these herbalists sold any of the more active poisonous drugs, such as henbane, savin, foxglove, lobelia, which might be used for unlawful purposes. But on asking for such articles the proprietor of the shop was most careful in assuring me he never sold anything that was at all poisonous. But I think his statements must be received with caution, for I noticed in a corner a bill stating that stramonium was sold for smoking at 3*d.* per ounce. On asking also for henbane seeds he told me he had none, although he did occasionally keep them, but never at any time sold them except in very small quantities, certainly not enough to do anyone any harm. He evidently rather mistrusted me, for a couple of days later I sent a friend to the same shop, who readily obtained some with the following directions for their use as a remedy for toothache:—To place some on a hot shovel, that a white smoke would arise, over which the patient was to hold his open mouth. The package was labelled, "Henbane seed, poison."

Of the following plants described, the medical and economic purposes for which they are at present employed, are given on the authority of Sowerby's 'British Botany,' and Barton and Castle's 'British Flora Medica.'

Linum Catharticum, purging flax, mill mountain.—First mentioned by Thalius in the 16th century. Whole plant used. Inodorous. Taste very bitter. Active principle probably a bitter extractive. By the concurrent testimony of nearly all the old writers this plant is a safe and effectual cathartic. The infusion is said to be more purgative than senna. But its action at times is somewhat uncertain. It is commonly used in Wales and Scotland. It is even now retained in some Pharmacopœias.

In some parts of the country it is boiled in ale and the decoction given for rheumatism. The usual dose is 1 drachm of the dried plant, or a handful of the fresh herb infused in water or whey.

Gerard relates how he came to be acquainted with the plant while in company with Dr. Lake, afterwards Bishop of Bath and Wells, and "who always used this herbe for his purge after the said manner as his man affirmed; putting a handful of Mil Mountain into a small tunne or pipkin of a pinte, filled with white wine, and setting it on the embers to infuse all night, then drinking the wine in the morning, fasting."

Agrimonia Eupatoria.—In Barton and Castle's 'British Flora Medica' the specific name is said to be derived from the Greek "hepar," the liver, from its value in diseases of that organ, but this derivation seems far from satisfactory. Also called "philanthropos," on account of its beneficent and valuable properties. It is official in the French Codex. The plant has a faint agreeable odour which is nearly lost on drying. The flowers are said to smell like apricots. It contains a great deal of astringent matter to which probably most of its properties are due. An infusion is considered very beneficial in jaundice and liver complaints and dropsy. Also used as a diuretic and vermifuge. Has been used in North America with great success in fevers. Also considered a purifier of the blood in cutaneous diseases and eruptions. The infusion forms a very good gargle for sore throat. An old writer recommends agrimony to be taken with a mixture of pounded frogs and human blood as a remedy for internal bleeding. A decoction made with wine and drunk, was reputed an antidote for the bites of serpents.

Culpepper says, "the leaves and seeds being stamped with old swine's grease, and outwardly applied, helpeth old sores, cancers, and inveterate ulcers, and draweth forth thorns, splinters of wood, nails, or any other such thing gotten into the flesh."

Agrimony has been employed for the tanning of leather. It also furnishes a good yellow dye.

Bryonia Dioica, white bryony.—Official in the French and United States Pharmacopœias. The dried root, according to the herbalist from whom I obtained it, is a valuable tonic and stomachic, similar to gentian. He said working men bought much of it to chew whilst they were at work. But I think he must certainly be in error, for all the works to which I have referred give its properties as being acrid and purgative, and in large doses emetic and poisonous. From its great activity when fresh it is called in France the "devil's turnip." Pereira mentions a case of poisoning by it, the symptoms of which were mistaken for those of cholera by the practitioner who attended the case. Both this plant and the black bryony, *Tamus communis*, contain an active alkaloid, bryonin, intensely bitter, soluble in water and alcohol. Twenty-two grains killed a rabbit in ten hours, 34 grains injected under the skin of a dog killed it in fifty-eight hours. The root of white bryony is used in Germany and Sweden as a purgative, and also as a vermifuge. With regard to this latter use there are some extraordinary stories on record of its efficacy in expelling

* Read at a meeting of the School of Pharmacy Students' Association, March 27, 1884.

toads and frogs and several nondescript animals from the abdomen. The fresh root is used externally as an application to bruises. Withering says a decoction of the fresh root is the best purge for horned cattle.

Gerard says the bruised root mixed with sulphur and vinegar is used for rubbing on the face to remove freckles and spots. The berries are poisonous and emetic. The young spring shoots when boiled have been eaten as a vegetable. The forked root is sometimes offered by herb gatherers around London as mandrake root.

Tamus communis.—Interesting as being the only British illustration of the Yam family, yams forming an important article of food in all tropical countries.

The large fleshy root or rhizome is the part used. It possesses very similar properties to those of white bryony. My herbalist said he had a great demand for it, and always kept it in the fresh and moist state. It was, he said, a most valuable application to bruises. He was quite celebrated for the number of black eyes he had cured with it. As his shop is in close proximity to Seven Dials, I have not the least doubt of the accuracy of that statement. The manner of using is to scrape the fresh root into a pulp, and apply as a poultice or plaister. The root of Solomon's seal, *Polygonatum officinale*, is also used for the same purpose, but more rarely, fresh raw beef being a common substitute. The young shoots of black bryony and other species of *Tamus*, when well boiled, are said to greatly resemble asparagus. Cooked in this manner with oil and salt they are much eaten by the Moors. The root taken internally is acrid and cathartic; it contains also much starch.

Sanicula Europœa, Wood Sanicle. — Although the word Sanicle has now come to mean something curative, it is not derived from the Latin "sanare" to heal, but from St. Nicholas or St. Nickel. There is a legend of this saint having interceded with heaven in favour of two children, whom an innkeeper had murdered and pickled in a pork-tub; and he obtained their restoration to life and health. No wonder, therefore, that the old herbalists so vaunt the virtue of this plant, dedicated to him, as a healing agent. In the middle ages there were many proverbial sayings extolling its virtues as "He who has bugle and sanicle makes a joke of the surgeons," or "He who keeps sanicle has no business with a doctor." The leaves are the part usually employed, but the whole herb is frequently used. The taste is very harsh and bitter. Sir James Smith entertained the idea that it partook of the poisonous acridity which is so frequent in umbelliferous plants.

It is commonly considered a very excellent remedy for internal bleeding. The juice or decoction is applied externally for the cure of ulcers and removal of tumours. Gerard says, "it makes whole and sound all wounds and hurts, both inward and outward."

Galium aparine, cleavers, clivers, goose-grass, catch-weed.—Generic name from Greek "gala," milk, one of the species, *G. verum*, having been employed to curdle milk. Adrianus Junius alludes to it under the name of galium. The French name is "caille-lait," meaning curdle-milk. Its specific name aparine is from Latin "apairo," to lay hold of, because of its hooked bristles which attach themselves to passing objects. Young geese are extremely fond of it, hence the name goose-grass. The plants of this family are called bedstraws, from our ancestors having used their stems to stuff their beds with.

Properties.—Aperient, diuretic, antiscorbutic. Principally employed as a so-called spring medicine for purifying the blood. Has also been used in dropsy. As an outward application it was considered of the greatest value for the cure of cancers, scrofulous and scorbutic ulcers, the inspissated juice being used for that purpose. It used to be taken as a decoction to prevent persons from growing corpulent (perhaps it is an ingredient in Allen's anti-fat !) It was once thought to be a remedy for the bites of adders and poisonous spiders.

The roasted seeds have been employed as a substitute for coffee, which belongs to the same natural order. The madder belongs to the same order, and like that plant, the root of *Galium aparine* is said to furnish a red dye. Small birds that feed on it are said to have their bones tinged with red from this reason.

Artemisia Absinthium. — Wormwood. — The dried flowering tops are official in U. S. Pharmacopœia and the French Codex. Taste persistently bitter. Odour, strong and aromatic; reported to drive away fleas and other insects. Contains 1·5 per cent. volatile oil, isomeric with camphor, bitter, resinous and extractive matter, and a peculiar neutral principle called "absinthin." This is the essential bitter constituent of the plant. Wormwood is used as an anthelminthic and aromatic tonic; in the green state steeped in vinegar as a fomentation for bruises and sprains. Much employed in France in the preparation of the liqueur known as absinthe, which is very largely consumed in that country. In large doses wormwood produces headache, giddiness, and narcotic effects due to the volatile oil; in the lower animals it causes death. The salt obtained by lixiviating and evaporating the ashes of the plant, formerly much used and highly celebrated by the name of salt of wormwood, is merely K_2CO_3.

Culpepper's remarks on this herb are somewhat curious, and serve as an illustration of the absurd way in which he ascribes the virtues of plants to planetary and astrological influences. He says: "Wormwood is an herb of Mars. It causeth an appetite for meat, because Mars ruleth the attractive faculty in man. The sun never shone upon a better herb for the yellow jaundice than this. Wormwood, being an herb of Mars, is a present remedy for the biting of rats and mice. Mushrooms are under the dominion of Saturn; if any have poisoned himself by eating them, wormwood, an herb of Mars, cures him, because Mars is exalted in Capricorn, the the house of Saturn, and this it doth by sympathy. Suppose a man be bitten or stung by a creature, as a wasp, a hornet, a scorpion, wormwood, an herb of Mars, gives you a present cure. Mix a little with your ink, and neither rats nor mice will touch the paper that is written with it. Moths are under the dominion of Mars, his herb wormwood being laid among clothes will hinder moths from hurting them. The right eye of a man and the left eye of a woman the sun claims dominion over; the left eye of a man and the right eye of a woman are the privilege of the moon: wormwood, an herb of Mars, cures both. A draught of wormwood beer, taken every morning, is a certain remedy for a stinking breath." This is a sample of the medical treatises of our forefathers. Gerard also mentions that wormwood is an antidote for the poison of mushrooms, toadstools, and hemlock, and a remedy for the bite of the shrew mouse and sea-dragon.

Artemisia vulgaris, Mugwort.—Name derived from maggot wort, being sometimes used as a vermifuge. Before the introduction of hops it was much used for infusing in beer; some suppose the word mugwort formerly bore allusion to that use. The fresh flowering tops, when rubbed, have a fragrant and aromatic odour. The taste is sweetish and slightly bitter. An infusion is considered a good tonic, and is sometimes used as a remedy for intermittent fevers. It has also been recommended in epilepsy and convulsions. But its principal use is as a fomentation and emmenagogue. The powder of the dried leaves taken in wine is said to be a most speedy and certain cure for sciatica. A decoction applied outwardly is also used for the same purpose. Gerard and others recommend it as the best antidote for opium. The flesh of poultry and geese is said to be rendered more tender and savoury by being stuffed with this herb. The ancients used it for fattening animals. Pliny says the sheep of Pontus became very fat and were always without gall after eating this plant. He also remarks that if a traveller tie this herb around him he will feel no weariness, be hurt by no poison, nor by any wild beast.

Tanacetum vulgare, Tansy.—Name derived from St. Athanasius. Official in the U.S. Pharmacopœia and French Codex. Possesses similar properties to the two plants last mentioned. Resembles wormwood somewhat in odour and taste. Employed as an anthelminthic, tonic, stimulant, and blood purifier. In Gerard's time it was a common custom in the spring season to make cakes of the young leaves fried with eggs, and these were eaten with the notion that they purged the body of its foul humours. He also says the root preserved with sugar is an especial remedy against the gout, if every day, for a certain space, a reasonable quantity thereof be eaten fasting. According to Withering, if meat be rubbed with tansy leaves it is effectually preserved from the attacks of the flesh fly. It is also reputed to drive away insects from a bed in which it is laid. Was formerly much eaten in Lent as the representative of the bitter herbs commanded to be eaten with the Paschal lamb. Dr. Threlkeld relates the case of a soldier at Montpelier, who was cured of an obstinate dropsy by a decoction of tansy alone. In the *Pharmaceutical Journal* ([3], ii.) tanacetic acid is mentioned as a vermifuge, and substituted for santonin. It has a sharp bitter taste, insoluble in water, soluble in alcohol and ether. Forms crystallizable salts with bases. The volatile oil of tansy is said to be poisonous. In the *American Journal of Pharmacy* for 1882 there is a full analysis of tansy by O. Leppig. He gives the active bitter principle as tanacetin ($C_{11}H_{16}O_4$), which exists in the plant combined with tannic acid. He gives various reactions and tests by which it may be detected.

Chrysanthemum Parthenium, Feverfew.—So called from its supposed febrifuge qualities (Prior). Sometimes called feather few from confusion of name with feather foil. Official in the French Codex. The whole plant has a strong odour, somewhat resembling chamomile or wormwood, but which is partially lost on drying, and a bitter taste. It contains a small quantity of resin combined with a bitter mucilage, and a bluish volatile oil, which may be separated by distillation with water. Its properties are considered to be tonic, stimulant, sudorific, diuretic, emmenagogue, and anti-hysteric. Was once much used in ague and intermittent fevers. Gerard says:—"It is used both in drinks, and bound to the wrists with bay salt, and the powder of glass stamped together, as a most singular experiment against the ague." Principally employed now to drive cold out of the system by promoting perspiration; and as an emmenagogue, etc., in the same way as pennyroyal. Has also been recommended as a vermifuge. Externally a decoction has been employed in fomentations. It was said by the old herbalists to be good for vertigo or swimming of the head, and for such as be melancholy, sad, pensive, and without speech. Its odour is said to be particularly disagreeable to bees, and that these insects may be easily kept at a distance by carrying a handful of the flower heads.

Achillea Millefolium, Yarrow, Milfoil, Nose Bleed.—Generic name from the Greek warrior, Achilles, who is said to have discovered its virtues, and by this plant healed the wounds of his companions in arms. Called nose bleed, because country girls tickle the inside of their nostrils with a leaf of this plant, saying—

"Yarroway yarrow, bear a white blow,
If my love love me, my nose will bleed now."

Known also as "old man's pepper," from the pungent taste of its foliage. The leaves and flowering tops have a fragrant aromatic odour; they are official in the French Codex. It is principally used by herbalists for the cure of colds. I am told the patient is given a large quantity of yarrow tea to drink and is then put to bed. Profuse perspiration sets in, and after a night's rest the cold is said to be entirely driven out. An old quaker who made some prentension to medical skill was asked the best thing for a cold, he said "Take a pint of yarrow tea made strong on going to bed, put a hot brick at thy feet wrapped in a cloth wet with vinegar, and thou wilt surely be well in the morning." He was then asked for a cure for rheumatism, "Take a pint of yarrow tea made strong on going to bed and put a hot brick at thy feet wrapped in a cloth wet with vinegar and thou wilt be well in the morning." On being asked the best thing for worms in children, he said "Take a pint of yarrow tea made strong on going to bed, put a hot brick at thy feet, etc., etc." And for every disease that could be brought to mind he gave the same answer. Yarrow is much used in Norway for rheumatism. The Swedes infuse the flowering tops in beer to increase its intoxicating qualities. Has also been used as a styptic and vulnerary; a decoction as an anodyne fomentation. The leaves are chewed as a remedy for toothache. There is an ancient charm for the cure of tertian agues with yarrow. A leaf is to be pulled off with the left hand, pronouncing at the same time the sick man's name and this leaf is to be taken.

Arctium Lappa. Burdock, bur, or clot bur; official in the U.S. and French Pharmacopœias. The appearance of the involucres is well known. Country boys use them for catching bats by throwing them in the way of their flight. The bats entangle their membranous wings in the hooked bristles, and are thus brought to the ground. Virgil recommends it to be extirpated from the meadows in which sheep are fed, as it lessens the quality of their wool. The root is much used in disorders of the skin, being diaphoretic, tonic, and slightly purgative. Has also been used in dropsy, rheumatism, bladder complaints, and scrofula. It is thought to resemble sarsaparilla in its mode of action, and, like it, is used for purifying the blood. Recently recommended in Squibb's 'Ephemeris' as a remedy in certain skin disease. Some old writers considered it a specific in gout. The scraped root applied as a poultice has been found an excellent application to foul ulcers and various cutaneous affections. The bruised leaves are also used for the same purpose. The seeds are diuretic, and employed also by herbalists in nervine elipepsy. The young stalks split open and the rind removed, form a delicate vegetable when boiled. In the raw state they are eaten with oil and vinegar as a salad. Several varieties of this plant are cultivated in Japan as a vegetable under the name of "Gobo." There is an article on its used as a culinary vegetable in the *Journal of the Acclimatisation Society of France*, for August, 1883.

Symphytum officinale.—Comfrey, fr. Latin "confirma;" called also "knit back" from its strengthening and restorative qualities, formerly known as "Consolida major." In the French Codex still called "Grande consoude." Called "bone-set," because the root was used in the form of a poultice and bandage round broken legs, and, in drying, hardened like plaster of paris, forming a splint. The root contains much starch and mucilage, with slight astringency. Principally used internally for what are popularly know as inward wounds, its mucilaginous properties probably being the principal reason of its employment. Boiled in milk used for spitting of blood in consumption. The most marvellous virtue attributed to it by the old writers is, that if it be boiled in a pot with meat that is chopped in pieces, its healing powers are so great it joins the pieces of flesh together again. The young leaves and shoots are sometimes eaten as a vegetable, and are said to form a good and nutritious food. Leaves used to flavour cakes. Comfrey is much relished by cattle, and is frequently cultivated as a fodder.

Marrubium vulgare, white horehound.—Name supposed to be derived from Hebrew "marrob," which signifies a bitter juice. In Arabic languages at the present day "Marout" means a bitter plant. The whole plant has a peculiar aromatic odour, somewhat vinous or musky. Taste, very bitter and astringent. Official in the U.S. Pharmacopœia and French Codex. Not used professionally in this country, although it seems to merit some attention. One of the most popular remedies for coughs, either preserved as syrup or candy, or as an infusion of

the dried herb. A decoction of horehound with cayenne pepper is given for colds. It has been found of great service in asthma, chronic catarrh, and pulmonary consumption; it has also been used in scarlatina and intermittent fevers, and as a stimulant and tonic in chlorosis and hysteria. By the ancients it was extensively used with the view of removing obstructions of the lungs and viscera. The green leaves, bruised and boiled in lard, used as an ointment, were reputed to heal dog bites. Linnæus records an instance in which salivation, occasioned by the continued use of mercurial medicines, was removed by the administration of an infusion of horehound, after every other remedy had failed. In Devonshire a beer made with yeast, white horehound, and sugar, is much esteemed as a remedy for coughs, and a palliative in consumption.

Teucrium Scorodonia, wood sage.—Properly wood-germander, called wood sage from the shape of its leaves. The whole plant is very bitter and aromatic, contains volatile oil, and a bitter principle found in all the species of this genus. Much used by herbalists as a tonic for purifying the blood and in chest complaints. With regard to its recent employment, I have been informed on the most trustworthy authority of a difficult case of pyrosis, which was cured by this plant alone. It is used as a poultice with linseed in sores and inflammations. I quote the following from the book of a well-known medico-botanist, Dr. Coffin:—"A patient had a tumour on his left hand the size of a hen's egg. The doctors said he must have it cut or he would lose his hand. Being in great pain he applied a poultice of Indian meal, and wood sage in the green state; he obtained ease in ten minutes. By continuing the same treatment the tumour disappeared in a fortnight."

Verbena officinalis, common vervain.—This plant has been known and celebrated from the most ancient times. Magical virtues especially having been attributed to it in all ages. The Greeks called it ἱερά βοτάνη or holy herb. Virgil says the priests bound it about their temples on the morning of the death of Æneas. In the time of the Druids it was held in high repute, their veneration for it was almost as great as for the mistletoe; they wore it as a charm against evil and witchcraft, and for good luck. In more recent times it entered into the composition of various love-potions, and other mystic compounds. During the last century it was brought forward by an empiric as a remedy for scrofula, a piece of the root being suspended round the patient, while other medicines were taken internally. Its influence in this disease was supposed to be due to sympathetic action. The plant is very bitter, but, notwithstanding all that has been said in its praise, and the marvellous cures it is reputed to have wrought, its medicinal qualities do not appear to be very valuable. The herbalists, even of the present day, consider it of great value. They say that as an emetic it is superior to ipecacuanha, and rank it next to lobelia, which they esteem the best of all; they also say it is one of the most powerful sudorifics in nature. They use it as an antiscorbutic and vermifuge, for colds, coughs, pains in the head, fever, and small-pox. It is still official in France.

Erythræa Centaurium, centaury.—Well known to the ancients; named from Chiron the Centaur, because it cured him of a wound caused by an arrow poisoned with the blood of the Hydra, which he dropped on his foot whilst examining the weapons of Hercules. The plant is nearly inodorous. The taste is intensely bitter, which caused it to be formerly called fel terræ or gall of the earth. It is one of the most valuable of our native plants, and, till lately, was official in our pharmacopœias; it is still included in the French Codex. It is much employed by physicians on the continent in dyspepsia and intermittent fevers, and sometimes as a vermifuge. The principal constituent is "centaurin," a bitter resinous body, which, combined with hydrochloric acid, has proved a powerful and valuable remedy in low fevers. Centaury is a safe and valuable tonic, possessing all the active properties of *Gentiana lutea*; in fact, it is better in some respects, being less apt to disorder the digestive organs than preparations of the latter plant. In intermittent and other febrile disorders it has supplied the place of cinchona bark. It is a general corrective in bile and liver complaints, jaundice, and indigestion. It has been also used in hydrophobia, kidney diseases, and gout. It was a principal ingredient in the once celebrated Duke of Portland's gout powder.

Menyanthes trifoliata, buck-bean, marsh trefoil.—Nearly allied to centaury. It was also official until recently, and is still retained in the French Codex. It possesses somewhat similar tonic properties, is also slightly astringent, and, in large doses, purgative and emetic; its properties are due to an active principle, menyanthin. It has frequently been used as a substitute for bark, as it grows in marshy districts where remittent and low fevers abound. The dried leaves are given, in powder, in doses of 20 to 30 grains in intermittent fevers, chronic rheumatism, and in some cutaneous disorders. The plant is employed medicinally in Germany to a very great extent. In Lapland, in times of scarcity, the dried roots, powdered and mixed with a little flour, are used as food, but the bread thus made is designated by Linnæus as very bitter and detestable. The dried leaves have been used instead of hops for preserving beer, two ounces of dried leaves being equivalent to a pound of hops. The herbalists of the present day extol it as a most valuable bitter, and remedy in biliary complaints. Its virtues, in a book written by one of their number, are said to be far superior to the quinine and morphia of the doctors' shops.

RECENT STUDIES ON THE CONSTITUTION OF THE ALKALOIDS.*

BY SAMUEL P. SADTLER, PH.D,

The sciences of to-day present, as might be expected, a very different aspect from the same branches of knowledge as they appeared fifty or sixty years ago. It is not merely that the mass of observations in most of these lines of study has enormously increased during this interval. Were that all, the change could hardly be considered as an unmixed benefit, because of the increased difficulty of assimilation of this additional matter. Many would be the contradictions in the observations and hopeless would be the task of bringing order out of such a chaos. The advance in the several branches of knowledge has been largely one resulting from improved methods of study, rather than one following simply from diligence in the application of the old ways.

Let us turn to chemistry for our illustration of this. The chemistry of the last century and the early decades of this was largely a descriptive science, such as the natural history branches, zoology and botany, are still in great part. Reasonably exact mineral analyses were made, it is true, but the laws of chemical combination and the fundamental conceptions of atoms and molecules had not been as yet generally established. Now, this want of comprehensive views of chemical reactions, their why and wherefore, was bad enough as it affected the study of inorganic and metallic compounds, but what must have been the conditions for studying the complex compounds of carbon, so widely spread in the vegetable and animal kingdoms. Their number is so enormous that, in the absence of any established relationships, not much more than a mere enumeration was possible for the student of this branch of chemistry. It is only within the last twenty years that chemists have attained to any comprehensive views at all in the domain of organic chemistry. It has been found possible to gradually

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range most carbon compounds under two categories, either as marsh-gas or as benzol derivatives, as fatty compounds or as aromatic compounds. To do this, methods of analysis very different from those used in mineral chemistry had to be applied. The mere finding out of percentage composition tells us little or nothing about an organic compound. What the elements are that compose the compound is not to be found out. That can be told beforehand with almost absolute certainty. What is wanted is to know how the atoms of carbon, hydrogen, oxygen and nitrogen are linked together, for, strange to say, these differences of groupings, which may be found to exist between these three or four elements, endow the compounds with radically different properties and serve us as a basis of classification.

The development of this part of chemistry, therefore, required very different methods of research. Instead of at once destroying a compound in order to learn of what elements it was composed, we submit it to a course of treatment with reagents, which take it apart very gradually, or modify it in the production of some related substance. In this way, we are enabled to establish its relations with well-defined classes and to put it in its proper place. Of equal importance with the analytical method of study, however, is the synthetical. This method of research, as applied to organic compounds, embodies in it the highest triumphs of modern chemistry. It has been most fruitful of results, both theoretical and practical. Within recent years, hundreds of the products of vegetable and animal life have been built up from simpler compounds. Thousands of valuable dye-colours and other compounds used in the arts attest its practical value. It may, therefore, seem anomalous when I say that one of the most important of all the classes of organic compounds has not shared in this advance. The alkaloids, that most important class from a medical and pharmaceutical point of view, have until quite recently been defined in the books simply as "vegetable bases, containing nitrogen." Whether they were marsh-gas or benzol derivatives was not made out; how the four elements, carbon, hydrogen, oxygen and nitrogen, were grouped together in them was absolutely a thing unknown. Chemists all admitted two things—first, that their constitution was very complex, and, second, that the synthesis of any of the more important medicinal alkaloids would be an eminently desirable thing to effect from every point of view. Within the last five years, however, quite considerable progress has been made in arriving at a clearer understanding of these most important compounds, and I shall offer to your attention this evening a brief statement of what has been done and what seems likely to be accomplished in the near future.

It was early recognized that the alkaloids were complex amines or ammonia derivatives. The more or less strongly marked basic character of these bodies, the presence of nitrogen as an essential element, and, above all, the analogy shown to ammonia in the way these bases united with acids to form salts, not by replacement of the hydrogen of the acid, but by direct addition of acid and base, pointed unmistakably to this constitution. But with this granted, the simplest alkaloid formulas, those of conine, $C_8H_{17}N$, and nicotine, $C_{10}H_{14}N_2$, still showed that the amine molecule contained quite complex groups of carbon and hydrogen atoms, and the great majority of the alkaloids—the non-volatile ones—contained groups in which the three elements, carbon, hydrogen and oxygen, all entered. Hence the difficulty in acquiring a knowledge of the molecular structure of those alkaloids at all comparable with that attained in the case of other organic compounds. Of course synthesis could not be applied until analysis had revealed something of the molecular grouping of these compounds, so the action of different classes of reagents was tried upon the alkaloids. Before summarizing the results of this study of the decomposition and alteration products of the alkaloids, a brief reference to a related class of organic compounds will be of assistance to those unfamiliar with recent researches in this field.

It is well known that in coal-tar is found a series of ammonia-like bases, aniline or amido-benzol, toluidine or amido-toluol and xylidine or amido-xylol, which are utilized practically in the manufacture of the so-called aniline dye-colours. It is perhaps not so well known that there are other series of bases found there too. The first of these is the pyridine series, including *pyridine*, C_5H_5N, *picoline* (methyl-pyridine), $C_5H_4N\,(CH_3)$, *lutidine* (dimethyl-pyridine), $C_5H_3N\,(CH_3)_2$ and *collidine* (trimethyl-pyridine), $C_5H_2N\,(CH_3)_3$. This series is also found in relatively larger proportion in what is known as Dippel's oil, the product of the dry distillation of bones.

The second series is the quinoline series, including *quinoline*, C_9H_7N, *lepidine* (methyl-quinoline), $C_{10}H_9N$, and *cryptidine* (dimethyl-quinoline), $C_{11}H_{11}N$. The two compounds which give name to these series, pyridine, C_5H_5N, and quinoline, C_9H_7N, respectively, bear to each other a relation analogous to that existing between benzol, C_6H_6, and naphthalene, $C_{10}H_8$, and the theory generally accepted by those chemists who have been occupying themselves with these bases and their derivatives is that pyridine is simply benzol, in which an atom of nitrogen replaces the triad group, CH, and quinoline, the naphthalene molecule with a similar change. Indeed, Ladenburg has recently succeeded in obtaining benzol as an alteration product from pyridine in certain reactions. Moreover, from methyl-pyridine, $C_5H_4N\,(CH_3)$, would be derived an acid known as pyridine-carboxylic acid, $C_5H_4N\,(COOH)$, just as benzoic acid, C_6H_5COOH, is derived from methyl-benzol, $C_6H_5CH_3$, and from dimethyl-pyridine, $C_5H_3N\,(CH_3)_2$, an acid known as pyridine-dicarboxylic acid, $C_5H_3N\,(COOH)_2$, just as phthalic acid, $C_6H_4\,(COOH)_2$, is derived from dimethyl-benzol, $C_6H_4\,(CH_3)_2$. The same thing applies to quinoline as compared to naphthalene.

We may now look at the question of the decomposing effect of reagents upon the alkaloids. The means which have proved most efficacious in decomposing these bases are the action of oxidizing and reducing agents, of bromine, of organic iodides, of concentrated acids and alkalies, and of heat.

Taking up the volatile alkaloids, we find with regard to *Conine*; first, that the action of methyl iodide shows it to be a secondary amine, that is, it retains only one replaceable hydrogen atom of the original ammonia molecule. Its formula is therefore $C_8H_{16}NH$. From conine can be prepared methyl-conine, which also occurs in nature, and dimethyl-conine. From this latter has been gotten a hydrocarbon, C_8H_{14}, conylene, homologous with acetylene, C_2H_2. Conine, on oxidation, yields chiefly butyric acid, but among the products of oxidation has been found the pyridine-carboxylic acid before referred to. The formula of conine, $C_8H_{17}N$, shows it to be homologous with piperidine, $C_5H_{11}N$, a derivative of piperine, the alkaloid of pepper, to be spoken of later, and, just as piperidine is derived from pyridine by the action of reducing agents, so conine is probably derived from a propyl-pyridine. The artificial alkaloid, paraconine, isomeric with the natural conine, will be referred to later.

Nicotine, $C_{10}H_{14}N_2$, the next simplest in formula of the alkaloids, is a tertiary base, that is, contains no replaceable hydrogen atoms in its molecule. It shows very close relations to pyridine. When nicotine vapour is passed through a red-hot tube, it yields essentially collidine, and with this some pyridine, picoline, lutidine and gases such as hydrogen, marsh gas and ethylene. Heated with bromine water to 120° C., it decomposes into bromoform, carbon dioxide, nitrogen and pyridine. When its alcoholic solution is treated with ferricyanide of potassium it is oxidized to dipyridine, $C_{10}H_{10}N_2$. Potassium permanganate, chromic or nitric acid oxidizes it to nicotinic acid, $C_6H_5NO_2$, which is simply pyridine-carboxylic

acid, C_5H_4N (COOH), and which, distilled over quicklime, yields pyridine, C_5H_5N.

Turning now to the non-volatile and oxygenized bases, we take up first the opium alkaloids. *Morphine*, $C_{17}H_{19}NO_3$, is a tertiary amine, and appears to contain a hydroxyl group like phenols, to which class of bodies it has some analogies, as is shown in its reaction with ferric chloride. Its methyl ester, which can be formed from it, is *Codeine*, one of the accompanying alkaloids of opium. Besides the methyl derivative, however, others are possible, and several have been recently prepared, giving rise to a class of artificial alkaloids known as *codeines*. Morphine, rapidly distilled over zinc dust, yields phenanthren, trimethyl-amine, pyrrol, pyridine, quinoline, and other bases. The action of strong hydrochloric acid upon morphine changes it into apomorphine, $C_{17}H_{17}NO_2$, by the withdrawal of a molecule of water. Ferricyanide of potassium and caustic soda solution change morphine into oxydimorphine, $C_{34}H_{36}N_2O_6$. When heated with strong potassium hydrate, it yields methylamine.

Narcotine, another of the opium alkaloids, when heated with manganese dioxide and sulphuric acid, is oxidized and splits apart into opianic acid, $C_{10}H_{10}O_5$, and cotarnine, $C_{12}H_{13}NO_3$. This latter, by careful oxidation, yields apophyllenic acid, $C_8H_7NO_4$, and this, on heating with hydrochloric acid to 240° C., yields pyridine-dicarboxylic acid, $C_5H_3N(COOH)_2$. The base cotarnine also results from the prolonged heating of narcotine with water alone. In this case, instead of opianic acid, its reduction product meconine, $C_{10}H_{10}O_4$, is produced.

Meconic acid, $C_7H_4O_7$, which is found in opium in combination with the different bases, has also been investigated. By acting upon meconic acid with ammonia, comenamic acid is formed, and this latter, when heated with zinc dust, yields pyridine.

If we go now to the cinchona alkaloids, we meet with exceedingly interesting results. *Quinine*, $C_{20}H_{24}N_2O_2$, when carefully oxidized with chromic acid or potassium permanganate, yields a series of products. First is formed quitenine, $C_{19}H_{22}N_2O_4$, a weak base, then quininic acid, $C_{11}H_9NO_3$, then the so-called oxycinchomeronic acid, $C_8H_5NO_6$, and finally cinchomeronic acid, $C_7H_5NO_4$. Now the two acids last mentioned are simple substitution products of pyridine, oxycinchomeronic acid being a pyridine-tricarboxylic acid, $C_5H_2N(COOH)_3$, and cinchomeronic acid, a pyridine-dicarboxylic acid, $C_5H_3N(COOH)_2$. When distilled with potassium hydrate, quinine yields quinoline and its homologues. The alkaloid has been shown to be a tertiary base.

Quinidine yields with chromic acid the same decomposition products as quinine.

Cinchonine, $C_{19}H_{22}N_2O$, the second most important alkaloid of these barks, when oxidized with potassium permanganate, yields cinchonic acid, which is a quinoline-carboxylic acid, $C_9H_6N(COOH)$, cinchomeronic acid, which has just been stated to be a pyridine-dicarboxylic acid, and a pyridine-tricarboxylic acid. When cinchonine is treated with potassium hydrate, it is decomposed into quinoline and a solid body, which on further treatment yields a liquid base C_7H_9N, which is probably lutidine. It has been found, moreover, that both tetrahydroquinoline and dihydroquinoline, hydrogen addition products of quinoline, are present. When cinchonine is distilled with solid potassium hydrate, it yields pyrrol and bases of both the pyridine and quinoline series.

Cinchonidine, when heated with potassium hydrate, yields quinoline also, and with nitric acid the same products as cinchonine.

Strychnine has been found to be a tertiary amine. When distilled with potassium hydrate, quinoline is formed.

Brucine is a tertiary diamine, that is, formed by substition in a double ammonia molecule. When distilled with potassium hydrate it yields quinoline, lutidine, and two isomeric collidines.

The alkaloid *Atropine* has been quite thoroughly studied with results of great interest. When heated with either baryta-water or hydrochloric acid, it takes up a molecule of water and is split into tropine, $C_8H_{15}NO$, and tropic acid, $C_9H_{10}O_3$. This latter is phenyl-oxypropionic acid. Tropine, when heated to 180° C., with concentrated hydrochloric acid, splits off a molecule of water, and yields tropidine, $C_8H_{13}N$, a liquid base, with an odour resembling conine. When this tropidine is heated with an excess of bromine, it yields dibrompyridine.

Piperine, the alkaloid of pepper, has also been well-studied. When boiled with alcoholic potash solution, it takes up a molecule of water and splits apart into piperic acid, $C_{12}H_{10}O_4$, and piperidine, $C_5H_{11}N$. This latter base has been shown to be a hydrogen addition product of pyridine, C_5H_5N. When heated with concentrated sulphuric acid, it is oxidized to pyridine. Piperidine hydrochlorate, also, when heated with excess of bromine to 180° C., yields dibrompyridine.

Sinapine, the alkaloid which exists as sulphocyanate in white mustard seed, yields under the same reaction as that applied to atropine and piperine, quite different results. When boiled with baryta water, sinapine decomposes into sinapic acid, $C_{11}H_{12}O_5$, and choline, $C_5H_{15}NO_2$, the latter a well-known constituent of the bile, and produced also in the decomposition of the lecithin of the brain and yolk of egg.

Cocaine, the alkaloid of coca leaves, is decomposed by heating with hydrochloric acid into methyl alcohol, benzoic acid and a crystalline base ecgonine, $C_9H_{15}NO_3$.

Caffeine and *theobromine* have also quite different relations. Caffeine, it will be remembered, is the methyl ester of theobromine, and can be prepared from it. When caffeine is carefully oxidized with chlorine, it yields dimethyl-alloxan and methyl-urea. Both theobromine and caffeine are decomposed by heating to 240° C. in sealed tubes with hydrochloric acid, identical products being obtained. These products are carbon dioxide, formic acid, ammonia, methylamine, and sarcosine, the last three being of course in combination with the excess of hydrochloric acid. The artificial preparation of theobromine and caffeine from xanthine and guanine also shows clearly their relations.

If, having completed our survey of what has been done in the way of decomposing the alkaloids by the different classes of reagents, we review the field, it will be seen that with all the alkaloids mentioned, except the last four, a more or less immediate connection with the pyridine and quinoline bases has been indicated. The conviction accordingly forces itself upon us that, if we want to attack the problem of building up any of these important alkaloids artificially, we must turn to these bases as our starting point.

As already stated, both series occur in coal-tar and the pyridine series also more abundantly in bone-oil. Pyridine, picoline, lutidine, and collidine, the first four members of the pyridine series, have, moreover, all been formed synthetically, although the processes are not such as would yield the products as cheaply as they can be gotten from Dippel's oil. Quinoline, the first member of the higher series, had been made synthetically by several chemists, but by expensive and involved methods, when Skraup, in 1881, effected its synthesis from nitrobenzol and glycerin, or still better, a mixture of nitrobenzol and aniline with glycerin. This process allows of its being made on a commercial scale if desirable. Shortly after, by an application of the same principle, Döbner and Miller effected the synthesis of lepidine, the second member of the quinoline series.

At the same time that this general agreement to consider these bases as the starting point in the endeavour to effect the synthesis of the natural alkaloids had been arrived at by chemists, it was thought well to look into the question whether these bases and their immediate derivatives had any therapeutic value of their own.

Piperidine, the decomposition product of piperine, which we have shown may be considered to be hexahy-

dropyridine, was examined by Dr. Kronecker, of Berlin, at the request of Professor Hofmann, and was found to have an action upon animals in many respects resembling that of conine. Professor Filehne, of Erlangen, who has studied a large number of these pyridine and quinoline derivatives, found, moreover, that the hydrochlorate of ethyl-piperidine had a physiological action quite analogous to that of conine.

The physiological action of quinoline itself has been studied quite extensively by Donath and others, and it was found that several of its salts were quite valuable febrifuges, acting very like quinine, and capable in cases of being used as a substitute for it. In general, the hydrogen addition products were found to be more active than the simple base, an observation entirely in accord with the theory formed by Wischnegradsky, and by Königs, as the result of the study of the decomposition products of the alkaloids, viz., the alkaloids are in general hydrogen addition products of pyridine and quinoline, or of the two bases combined. Thus, Professor Filehne found that hydrochlorate of tetrahydroquinoline was much more energetic in its action than quinoline, but could not be used on account of a too powerful local effect. The hydrochlorate of dimethyl-tetrahydroquinoline, which was distinguished by its strong bitter taste, much resembling that of quinine, had an effect like that of curare poison. The most decided febrifuge action, however, was found by Professor Filehne to reside in the hydrochlorate of oxyhydro-methyl-quinoline, introduced to public notice by Professor O. Fischer under the name of "kairin," and in the acid sulphate of tetrahydro-methylquinoline, introduced under the name of "kairolin." These compounds had a very surprising febrifuge action, without any unpleasant after-effects or local disturbances.

The most active workers in the field of synthetic formation of the alkaloids have been Wischnegradsky, of St. Petersburg,—who, unfortunately for science, died at an untimely age in 1880,—Königs and Fischer, of Munich, and Ladenburg, of Kiel. The study of the decomposition products of the cinchona alkaloids especially points quite distinctly to the probable existence in quinine of a hydrogen addition product of pyridine, in combination with a methyl-quinoline group. The many experiments that are now being made to test this and other questions that suggest themselves will not long leave us in the dark. Whether a practical commercial synthesis of quinine will follow is another matter, but it is within the bounds of possibility, or perhaps even of probability.

It must not be supposed that no syntheses of alkaloids have been effected as yet. By heating butyl-aldehyde with alcoholic ammonia is formed *paraconine*, an alkaloid isomeric with the natural conine, but differing in physiological action. By the action of sodium upon pyridine is produced a compound, $C_{10}H_8N_2$, known as dipyridyl, and this, under the influence of nascent hydrogen, takes up six atoms and becomes *isonicotine*, $C_{10}H_{14}N_2$, a physiologically active alkaloid, isomeric with the true nicotine. The formation of a series of alkaloids under the name of *codeines*, by the substitution of other organic radicals instead of methyl in the codeine reaction, has already been alluded to. *Atropine* can be formed by uniting tropine and tropic acid, the two decomposition products already noted. The latter of these products is already shown to be capable of synthetical formation, and the other will no doubt be formed in the same way. The artificial atropine is identical with the natural alkaloid. Ladenburg has also formed a series of artificial alkaloids, called *tropeines*, by uniting the base tropine with different organic acids, as in the case of the compound of mandelic acid and tropine known as *homatropine*, an alkaloid of action similar to atropine, but possessing some decided advantages in its use. *Piperine* has also been made by the uniting of piperidine and piperic acid, and, as piperidine has already been formed from pyridine, we have here a true synthesis also. Both *theobromine* and *caffeine*, its methyl derivative, have been made from xanthine, which itself can be formed from guanine, a constituent of guano.

We may conclude, from this reference to what has been done in the last few years, that the reproach mentioned in first speaking of the alkaloids as a class, that almost nothing was known of their constitution, will not long remain, and that as their molecular structure is laid bare in these studies now being made, keen-sighted chemists will effect their artificial formation. When these most valuable compounds can be made by exact methods, in a state of entire purity, and at a cost much below that paid for the present extraction of them from relatively rare plants, organic chemistry will have placed all of us under obligations as great as those owing any branch of science, no matter how practical we call it.

SAPONIN.*

BY E. STÜTZ.

At the commencement of this paper, an historical account is given of saponin, a compound obtained from the *Saponaria rubra* and its allied species. The formulæ proposed for this substance, deduced from the percentage proportions of carbon and hydrogen found in it, are various, but most experimenters are agreed in proving that it is decomposed on boiling with acids, yielding a carbohydrate among other products.

The source of the saponin studied in this paper was the bark of the *Quillaia saponaria*, a member of the Spiræa family, indigenous in Chili and Peru. This was digested with water, the extract evaporated down, and hot alcohol of 90 per cent. added; on cooling, white flocks of saponin separated, which were then frequently recrystallized from alcohol, and finally purified by animal charcoal.

Saponin thus obtained is a white, amorphous, neutral powder, generally possessing an astringent taste, due to traces of impurities; it is soluble in water, insoluble in absolute alcohol and ether; its aqueous solution forms a lather like soap. When heated to 195° it turns brown, and at a higher temperature evolves a vapour resembling caramel in odour.

The author was unable to obtain saponin free from inorganic impurities; and from the properties of its barium compound it would appear probable that the impurities, principally consisting of calcium, were intimately associated with the saponin. From the mean of four concordant analyses the formula $C_{19}H_{30}O_{10}$ is deduced.

A concentrated aqueous solution of saponin is precipitated by baryta-water; a substance of composition

$$2C_{19}H_{30}O_{10} + Ba(OH)_2$$

being formed, from which the barium is not readily separated by carbonic anhydride. In order to determine the number of alcoholic hydroxyl-groupings present in saponin, it was heated with acetic or butyric anhydride under various conditions. A series of acetyl-derivatives was thus obtained; amongst which are enumerated a tetracetyl, $C_{19}H_{26}\overline{Ac}_4O_{10}$, and a pentacetyl, $C_{19}H_{25}\overline{Ac}_5O_{10}$, derivative, and two compounds formed by the addition of acetic anhydride to the latter substance, viz., $C_{19}H_{25}\overline{Ac}_5.O_9(O\overline{Ac})_2$, and $C_{19}H_{25}\overline{Ac}_5O_8(O\overline{Ac})_4$ From these results it follows that the saponin contains five hydroxyl groups and two oxygen atoms combined only with carbon; its constitutional formula will thus be: $C_{19}H_{25}(OH)_5.O_2.O_3$. From the acetyl-derivatives saponin can be regenerated.

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The Pharmaceutical Journal.

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JEAN BAPTISTE ANDRÉ DUMAS.

SIXTEEN months have barely passed since the occasion of a rare compliment paid by the Academy of Sciences to the greatest of contemporary French chemists, in a jubilee celebration, furnished us with an opportunity for referring to some events in the earlier parts of his career, when it was still associated with the routine of a French pharmacy, and now we have to record the fact that DUMAS is dead. France has lost a son who has richly helped to maintain her claim to pre-eminence in the realms of science, and every other civilized country will join her in paying a grateful tribute to the memory of the philosopher who passed away at Cannes on Friday last. But in the presence of so full a life of eighty-four years it would seem idle to affect surprise that the close should come, and almost irreverent to express much sorrow. Long as was this term of years they were crowded by DUMAS with effective work, and the results form no mean part of our present knowledge of physiology, and especially of chemistry. In any case the interest which the readers of this Journal would have in one who has contributed so much towards building up on a solid foundation the science which exercises a most important influence in their daily avocations would have been great, but in respect to DUMAS this is enhanced by the fact that it was in a pharmaceutical laboratory DUMAS made his first chemical experiments and that nearly half a century afterwards he was chosen to preside over a commission entrusted with the revision of the Pharmacopœia of his native country. It may be that these points of contact with pharmacy had their influence in inducing the Pharmaceutical Society of Great Britain to reflect honour upon itself by, in 1870, placing the name of the illustrious chemist upon its roll of honorary members; certainly they will be our sufficient warrant for referring again to some phases of his life and especially, but only briefly, to work not mentioned in our previous notice.

JEAN BAPTISTE ANDRÉ DUMAS was born in the closing year of the last century at Alais, in the department of the Gard. Originally intended for the naval profession, his aspirations in that direction were diverted by the political events of 1814–15, and he became an apprentice to a pharmacist in his native town. His opportunities there, however, appear not to have been commensurate with his ambition, and in 1816 he went on foot to Geneva, where, in addition to attending the lectures of DE CANDOLLE, PICTET and DE LA RIVE, he acquired practical experience as superintendent of a pharmaceutical laboratory. It was in this room that he delivered his first lectures on chemistry to a knot of fellow students, and it was there that in the ordinary course of business he made an analysis of sponge, which led to the introduction of iodine compounds into the materia medica. Before he was eighteen years of age he had produced two memoirs, one recording the observation that the water of crystallization is present in salts in definite equivalents, in which, however, he had been anticipated by BERZELIUS; the other laying down principles that still rule in the method of taking the density of solid bodies, and on which all subsequent inquiries on the atomic and equivalent volumes of bodies have been based. Whilst still occupied in the pharmacy a futile attempt to isolate the active principle of digitalis brought him into communication with PRÉVOST, with whom he soon became associated in systematic physiological investigations that have left their names indelibly connected with the study of the nature of blood and of fecundation. Indeed, it was the success of DUMAS as a physiologist that eventually brought him back to his chemical labours; for it led to a visit from HUMBOLDT, whose conversation raised in him an insatiable desire to visit Paris, which was gratified in 1823. There, through the influence of ARAGO, he obtained the post of assistant to THENARD at the École Polytechnique, whilst soon afterwards AMPÈRE obtained for him the chair of chemistry at the Athenæum, just vacated by ROBIQUET, and thus DUMAS came again fully under the influence of his earlier mistress, Chemistry. Notwithstanding the time taken up by these official duties, and the paucity of suitable apparatus, DUMAS at once re-entered the field of experimental investigation, and in 1826 published his classic memoir "On Some Points of the Atomic Theory," in which he stated that he was engaged in experiments intended to fix the atomic weights of a considerable number of bodies "by determining their density in the state of gas or vapour," and shadowed forth the distinction between molecules and atoms by urging the necessity of giving greater attention to AVOGADRO'S hypothesis that the molecules of gases were capable of further division, the division occurring in the moment of combination. About this time, too, he resumed with BOULLAY a dropped investigation of the compound ethers, which eventually not only threw a flood of light upon the relations that exist between what is now distinguished as ethylic alcohol and its ethers, but led to the discovery that in wood spirit, spermaceti, and potato spirit there were other bodies, exhibiting similar properties, each producing with acids its series of ethers and yielding an acid when treated with oxidi-

zing agents, whilst they differed from one another in composition by one equivalent of carbon and two of hydrogen, or multiples of that quantity. Here was the first page in the history of the homologous alcohols and their derivatives, which has since become one of the most richly developed in the domain of chemistry. Whilst following up this investigation an apparently fortuitous inconvenience suffered at a *soirée* at the Tuileries through the irritating vapours diffused from some wax candles led to the inference that chlorine used in bleaching had been retained by the wax in definite proportions, the outcome being the theory of substitution, which opened up a new world of research to chemists. In 1846 DUMAS showed that between formic and margaric acids it was possible that there existed a series of fifteen other acids, of which only nine were then known, passing from one extreme to the other by steps of CH_2, and thus was provided the starting point for the homologous classification of the fat acids. Between 1858 and 1860 DUMAS published the results of numerous researches in previous years upon atomic weights of the elements, which, like the manipulative processes associated with his name, had been incidental but necessary preliminaries to the satisfactory performance of other work. Thus the correction of the atomic weight of carbon, which had been fixed by BERZELIUS at 12·24, was indispensable to any satisfactory progress in knowledge of the carbon compounds. It was natural that under these circumstances he should have devoted much attention to the examination of PROUT'S hypothesis that the different elements consist of the same primordial matter in different physical conditions, and although his results precluded an admission that the theory was supported by the atomic weights of all other elements proving to be multiples of hydrogen taken as unity, he seems not to have been disinclined to believe that the unity would be found at some lower point. At any rate, his speculations in connection with this question were very ingenious and interesting and went much further than is generally admitted towards the establishment of what is now known as the "periodic law." Afterwards his experimental work again approached the field of physiology, in that it was devoted to the phenomena of nutrition, the formation of sugar in the organism, the composition of blood, and allied questions, and in 1872 he published his theory as to the nature of alcoholic fermentation.

Notwithstanding the variety and scope of the investigations thus hinted at rather than outlined they formed only a part of the labours of DUMAS. To these must be added his work as professor, author, journalist, member of numerous commissions, politician and Perpetual Secretary to the Academy of Sciences. These all belong to his public services, which is the portion of his life in which we are most interested. But there is another aspect of the man that should not go unnoticed. It would seem as if he regarded the valuable sympathy and help given to him liberally in his earlier years by HUMBOLDT, LAPLACE, ARAGO, and other eminent men, as a trust to be handed on to succeeding aspirants to fame. His relations with his contemporaries were also admirable, and although he engaged in some sharp polemical passages with men working on similar subjects, they were never allowed to become embittered or lead to injustice. Thus, although BERZELIUS, naturally disturbed by the irreverent manner in which some of his conclusions as to the atomicity of the elements were overthrown by the experimental work of the younger man, did not hesitate to adopt a tone which was apt to provoke retort, DUMAS went out of his way years after, when again writing on the subject, to caution experimenters that if working under the same conditions they arrived at results different from those put on record by BERZELIUS, it would be the safer plan for them to assume that they had made a mistake. So also with LIEBIG: the many collisions between the two great chemists did not prevent DUMAS from publicly testifying to the admiration he felt for his great German rival, or LIEBIG from dedicating to DUMAS an edition of his famous 'Familiar Letters.' DUMAS was equally generous in his recognition of the genius of our own countryman, FARADAY, and a passage taken from the first Faraday Lecture, delivered by him in 1869, may with a slight alteration be well addressed to France at the present time—

"Mutato nomine, de te
Fabula narratur."

"The name of your illustrious fellow-countryman "is not one which any single nation can claim as its "exclusive property; his labours and discoveries are "as widely recognized in England, in Germany, and "in America, as in France. DUMAS belongs to the "whole world. There is not a spot on this earth to "which civilization has penetrated that does not "claim the right of participating in the respect and "gratitude you entertain for him."

The Aberdeen Society of Chemists and Druggists met in the Palace Hotel, on April 8, to present their esteemed Secretary, Mr. Alexander Strachan, with a testimony of their appreciation of his services in connection with the Society. The testimonial took the form of a marble timepiece, two equestrian bronzes, and a complete set of table cutlery. The meeting was largely attended and enthusiastic.

* * *

The Secretary of State for India has been pleased to appoint Mr. David Hooper, F.C.S., as Quinologist to the Nilgiri Government Cinchona Plantations in the Madras Presidency. Mr. Hooper was a Pereira Medallist of the Pharmaceutical Society in 1880, and has been lately engaged as analyst in the laboratory of Messrs. Southall, Brothers and Barclay.

* * *

In connection with the forthcoming International Health Exhibition provision is being made for an ample supply of literature in the form of a series

of official Hand-books. Among these are to be specially written works on 'Healthy and Unhealthy Houses in Town and Country,' by Mr. W. Eassie and Mr. Rogers Field, C.E.; 'Heating, Lighting, and Ventilation,' by Captain Douglas Galton; 'Food,' by Mr. A. W. Blyth; 'Principles of Cookery,' by Mr. S. Berdmore; 'Food and Cookery for Infants and Invalids,' by Miss Wood; 'Alcoholic Drinks,' by Dr. J. L. W. Thudichum; 'Non-Alcoholic and Aërated Drinks,' by Professor Attfield; 'Fruits of all Countries,' by Mr. W. T. Thiselton Dyer; 'Condiments, including Salt,' by the Rev. J. J. Manley; 'Laboratory Guide to Public Health Investigation,' by Mr. W. W. Cheyne and Dr. W. H. Corfield; 'Physiology of Digestion and the Digestive Organs,' by Professor Arthur Gamgee; 'Fermentation,' by Dr. Duclaux; with a Preface by M. Louis Pasteur; and 'Spread of Infection,' by Mr. Shirley F. Murphy. It is announced that the Exhibition will be opened on Thursday, the 8th of May, by H.R.H. the Duke of Cambridge, acting on behalf of the President, H.R.H. the Prince of Wales.

* * *

The recent convictions in Massachusetts for the sale of drugs not answering to the standard of the United States Pharmacopœia appear to have provoked a curious counter-move. It is reported that an attempt is to be made to deprive the Pharmacopœia of the precedence at present accorded to it as the authoritative standard for the quality of articles included in it and bring it down to the level of a "community," whilst the 'United States Dispensatory,' which is essentially a commentary on the Pharmacopœia, is to be raised to the dignity of chief standard. As, however, there are at least two other important rivals of the 'Dispensatory,' which, like it, are private ventures, it is not probable that the attempt, if made, will succeed without a struggle.

* * *

An extraordinary specimen of paternal legislation has recently been introduced into the United States National House of Representatives, with the view of preserving from temptation the Chinese and other opium consumers in that country. The Bill provides for the prohibition absolutely of any importation of opium except in the form of aqueous extracts for medicinal use and tinctures, and would subject any person contravening its provisions by importing or dealing in solid opium to imprisonment for a term not exceeding five years.

* * *

Many of our readers will see with regret the account on another page of the circumstances attending the death of Dr. Henry Brown, of Northallerton, in whom they will recognize a former frequent correspondent of the "Dispensing Memoranda" columns of this Journal. Although the positive tone in which the communications of Dr. Brown were usually couched had a tendency to provoke irritation, there could be no doubt that the motive which prompted them was a sincere wish to impart useful information, and in discussing the different topics he frequently evinced a knowledge of pharmacy, and an appreciation of its importance, beyond what is usually manifested by medical practitioners.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, April 23, when a paper on "The Alchemists: their Failure and their Success," will be read by Mr. S. R. Atkins.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

April 9th and 10th, 1884.

Present on both days—Messrs. Baildon, Clark, Gibson, Gilmour, Kinninmont, Maben, Nesbit and Stephenson.

Professor Maclagan was also present on behalf of the Privy Council.

MINOR EXAMINATION.

9th.—*Sixteen* candidates were examined. *Nine* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Aspinall, William.....Platt Bridge.
Barlow, Ernest Silas .....Oldham.
Cappell, Robert .....Crieff.
Christie, James..... .....Old Meldrum.
Drake, Harry Francis .....Stowmarket.
Graham, Thomas Andrew .....Stirling.
Hamilton, Francis .....Glasgow.

10th.—*Fourteen* candidates were examined. *Nine* failed. The undermentioned *five* passed, and were declared qualified to be registered as Chemists and Druggists:—

McGuffie, Wm. Alexander .....Stranraer.
McIntyre, James .....Grantown.
Manson, William Mackenzie ...Edinburgh.
Riddiough, Fred .....Leeds.
Robertson, George ....Burntisland.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

A general meeting was held on Friday, March 28, at the Museum and Library, Queen's Road; Mr. James Walter White, President, in the chair.

After expressing in a few earnest sentences his appreciation of the services rendered to the Association by his predecessor, Mr. Schacht, Mr. White addressed the meeting as follows:—

"Gentlemen,—On such occasions as the present it has become the established rule for the President to open the proceedings with a few introductory remarks, sometimes called an address; and at first sight there would seem to be the very widest field for the choice of a subject connected with our calling. For the aspect of pharmacy is very many-sided, and the practice of its art comprises branches of knowledge so varied, and so comprehensive, that no man bound by the limits of average human intelligence can hope to acquire an intimate acquaintance with them all. Accordingly one finds that our trade literature abounds with dissertations upon all the arts and sciences allied to pharmacy; its ethics, and its trade questions, mingled with exhortations to young druggists entering upon life, and lucubrations from old ones about to quit it.

"As is to be expected also all kinds of opinions are represented in these addresses, and their matter has been considered from all points of view. For instance, you will find on the one hand that students are encouraged to consider themselves, one and all, adolescent Faradays and Tyndalls, needing only industry, perseverance and the flux of time, to develop into paragons of science and mines of wealth. On the other hand, you will see displayed to these same students all the perils of ambition; how far preferable it must prove to live content as honest mediocrities, and the supreme folly of attempts to set the Thames on fire.'

"Again, to some minds, the business of a chemist and druggist has appeared to be invested with the status of a learned profession; whilst more matter of fact spirits have acknowledged themselves to be mere drudges, whose mission was simply to work hard, live hard, die hard, and—not to expect much increase of dignity afterwards. There is of course nothing very remarkable in these diversities of opinion, and their mode of expression is generally admirable. They are commented on here simply as tending to show how thoroughly threshed out the subjects have been. Would that the process had resulted in a more copious yield of golden grain! and in making that remark I touch upon the dismal topic of the present condition of pharmacy. Perhaps it may be deemed fitting to the occasion if I restrict myself this evening to making in a few plain words a sort of profession of faith in relation to the topic just mentioned, because although my individual views may carry little weight, yet in the circumstances under which we meet, it would seem right to express them to my fellow members.

"Notwithstanding the immense advance in some directions which has been made through the influence of the Pharmaceutical Society, aided by the efforts of kindred associations established for the promotion of scientific pharmacy, it cannot be denied that as a body we have very grave reasons for dissatisfaction with the condition of our trade. I wish to state my belief that although the sources of discouragement are undoubtedly grievous, we are apt to lay too much stress upon some of them, and to show an amount of faintheartedness which does us little credit.

"Formerly the trade of a chemist and druggist was thought to be a very desirable one. The cost of apprenticeship, although higher than in many other trades, was not excessive, and the capital required for commencing business was comparatively small. Further, it was thought to be a genteel trade, requiring a greater amount of school learning than most others, involving the exercise of some scientific knowledge, and partaking in a small degree of the character of a profession. The profits, comparing isolated transactions with those of other trades, appeared to be very great, and indeed the business did offer the means of easily acquiring a moderate income.

"Now this was a condition of things far too good to last. It meant that even an ignoramus could make a decent living as a chemist and druggist, whilst people possessing an average amount or more of scientific knowledge and business aptitude were certain of attaining affluence. Our fathers benefited also from the profuse system of medicine taking which prevailed at the time, and which induced people to think that it was necessary to attack a disease with an array of physic bottles, just as soldiers attack a town with batteries of guns; but that system has had its day, and has produced a revulsion from which we are now suffering to some extent. With the advance of time came other changes more momentous. Increasing populations striving for means of livelihood crowded into the professions and trades and gave rise to unwonted competition. Thus it has come to pass in our day that only the fittest have a prospect of surviving in the throng, and that the blockheads are going to the wall. It is this keen competition which presses us most sorely; but it is inevitable, and must be manfully met and grappled with. For the world moves on, the old gives place to the new, and the imperfect to that which is more perfect; and though this progress often involves hardship to individuals, no sensible person will think it possible to arrest it. For my own part I do not believe any good can result from one-sided denunciations of the evils, real or imaginary, of cutting shops, or of co-operative trading. Both are facts, the existence of which must be recognized, and it is only by rigorous competition that we can hope for a solution of the problem which has now for some time perplexed tradesmen. Protective legislation cannot be hoped for, even if it were worth having; and, although the trial will probably be severe and damaging, the sooner it is faced the better.

"There is but one safe course to pursue. If blockheads and ignorami must henceforth starve, and only the most capable are to thrive, let us, by dint of scientific culture, and activity in business, endeavour to avoid being included in the former category, that we may share the success of the latter.

"A very mortifying phase of this competition trouble is the fact that the public are, with some exceptions, so slow to recognize that the responsibilities, knowledge, and scientific attainments of the latter-day pharmacist are worthy of some professional remuneration. Notwithstanding his life of anxiety, and of unremitting study and toil, he is begrudged any emolument he may claim on account of his responsible duties over and above a bare profit on the goods sold. We may reasonably expect that time will modify this anomaly.

"Another source of discouragement is the difficulty we experience in winning the confidence of the medical profession. A pharmacist may become a repository of all knowledge relating to the natural history, the commerce, the chemistry, the preparations, the properties, the doses, and the modes of administration of everything used in medicine. He may be an accomplished *savant*, and his name may be a household word throughout the world of pharmacy, yet the physicians of his own neighbourhood will scarcely trust him to make two grains of quinine into a pill. Very often they will prefer to have the pill prepared three thousand miles away by persons of whom they can know nothing at all, save that they have imported into this country attractive-looking assortments of such medicines, remarkable solely for the brilliancy of their hue, and the eccentricity of their shape. It might be expected also that the prescriber wishing to try a new remedy, or to administer a medicine in some new form, would look to the pharmacist as an intelligent adviser, with whom he might confer on practical points, which are important in guiding his decision. I am glad to acknowledge that this does often happen; but how often also do we have an experience like the following. A remedy is advertised purporting to be made from a herb gathered somewhere in the Antipodes, a plant without a name even, whose botanical affinities have not yet been ascertained, but whose virtues are extolled on faith of Indian medicine-men. This precious article is prescribed right and left, until presently a fresh nostrum engages attention, and the other falls into oblivion.

"Still another disappointment seems to be in store for the British pharmacist. He has excellent and well-founded claims for a substantial share in constructing our national Pharmacopœia: for taking that part which his fellows fulfil with benefit to the state in every civilized community besides our own. But by the time his claims are admitted, if ever they be, that work will possibly have ceased to exercise any influence on the medical mind, and may have been discarded by the prescribing doctor. *His* pharmacopœia bids fair to be the advertising pages of the medical journals, supplemented by circulars and samples, shoals of which pour in upon him daily. The poor pharmacist may find that he has been chasing an *ignis fatuus*, and once more may have to pocket his dignity with a sigh.

"We must hope, and indeed we cannot doubt that it may be possible, to counteract, and to prevail over these degrading and demoralizing tendencies by a right use of the means at our disposal. I believe that of those means, the highest scientific education applied in a sound commercial spirit will be found the most effectual.

"Let us trust that although our own personal aspirations may have been quenched in disappointment; it may yet remain for our posterity in the near future to enjoy that status and those rewards which we have striven to deserve."

Mr. G. F. Schacht then offered a communication upon—

Extract of Nux Vomica, and some Methods of Estimating the Alkaloids it contains.

Mr. Schacht said that his first words should be to remind his audience that the chief part of what he should endeavour to put before them was the result of the labours of two gentlemen, Messrs. Dunstan and Short, to whose ability and industry they could scarcely be too grateful; and he begged them to take notice that all he might have to say in criticism of their papers was limited to certain deductions they had drawn from a contemplation of their work, and did not in the smallest degree aim to disparage the work itself.

The results of these investigations had been placed before them by the authors themselves in a series of papers of great merit, which had been published from time to time in the *Pharmaceutical Journal*; and for present convenience he would endeavour to summarize what these gentlemen had done.

1. They examined experimentally the various methods of extracting the mixed alkaloids contained in nux vomica, and of determining the proportion in which they exist in the drug, and they supplied elaborate details of the one they considered the best, and in the course of these experiments they evolved a reliable process by which these alkaloids, strychnia and brucia, may be separated, the one from the other.

2. They reported upon the variation in alkaloidal strength of various samples of nux vomica as met with in commerce, from 3·9 per cent. to 2·74 per cent.

3. They reported upon the variation in alkaloidal strength of the tincture as met with in commerce, from 0·36 per cent. to 0·12 per cent.

4. They reported upon the variation in alkaloidal strength of the extract as met with in commerce, from 17·54 per cent. to 10·32 per cent.

5. Also that the relative proportions of the two alkaloids, strychnia and brucia, differ in different samples:—From 100 strychnia and 100 brucia to 100 strychnia and 179 brucia.

6. They reported that spirit of varying strength exerts different exhausting power on the drug, the most efficient being a mixture of 100 parts of spirit and 25 parts of water.

7. And in the light of these facts they conclude and recommend that the tincture and extract of nux vomica be authoritatively *standardized* as regards their *mixed alkaloidal* strengths, the standard they elect for the extracts being 15 per cent. of mixed alkaloids, and that of the tincture being 0·24 per cent.

Mr. Schacht continued — These results, Gentlemen, thus hastily summarized, represent a very large amount of work, and I beg to assure you, that work is of high order and deserves your careful study throughout.

I should like, however, to comment upon one or two points.

The plan Messrs. Dunstan and Short adopt and recommend for the estimation of the mixed alkaloids in the crude drug, the extract and the tincture, is described in full at page 442 of vol. xiv. of the Journal. It consists in obtaining a solution of the impure alkaloids in chloroform, washing them out as salts in acidulated water, precipitating with an alkali, dissolving the pure alkaloids in chloroform, evaporating the solvent and weighing the residue.

The method is undoubtedly accurate. A sample of the extract I here show you treated as above yielded to Messrs. Dunstan and Short 17·9 per cent. of mixed alkaloids, and to myself 18· per cent. But the process requires time and care, and a misadventure at any part of its course spoils the whole; it must be repeated from the beginning.

I have found a method of titration with potassic mercuric iodide, based upon the recommendations of Dragendorf, very nearly as accurate and much more easy of application. These are its details, as applied to the titration of the extract.

Prepare a test solution of potassic mercuric iodide by mixing 1·355 gram of perchloride of mercury with 4·98 grams of iodide of potassium and water to make 1 litre. Each c.c. of this solution precipitates 0·00184 gram of mixed strychnia and brucia.

Dissolve 1 gram of the extract to be examined in 30 c.c. of water, acidulated with 1 c.c. of hydrochloric acid, warm gently for half an hour and cool. Filter through paper and wash with water until the filtrate measures 100 c.c.

Of this solution take 10 c.c. in a small beaker and drop in from a burette sufficient of the test solution to throw down the whole of the alkaloids.

The point of completion may be determined, almost certainly, by the clearness of the supernatant liquor after stirring the whole with a glass rod, and may be confirmed by the addition of ammonium sulphide to a little of the filtered mixture which would render evident any excess of the precipitant. But the experiment is so easily and quickly performed that the result may be confirmed again and again with fresh quantities (10 c.c.) of the original solution under examination.

Of such a solution of 1 gram of the extract before you, 10 c.c. were found to require 9·7 c.c. of the test solution, and $0{\cdot}00184 \times 10 \times 9{\cdot}7 = 0{\cdot}17848$; therefore, the sample contained 17·848 per cent. of mixed alkaloids.

This result coincides very nearly with those obtained by Messrs. Dunstan and Short, and by myself when employing the more elaborate method.

I think our authors scarcely did justice to this process as applied to the particular case before us. It may, perhaps, have received some undue laudation in respect of its power to titrate alkaloids generally, but, as I venture to repeat, in the case of the nux vomica alkaloids it appears to be reliable.

And now I wish to discuss the deductions and recommendations suggested by Messrs. Dunstan and Short as the practical outcome of their labours.

Struck by the great variation in potential activity of nux vomica and its preparations, as measured by the proportions of mixed alkaloids contained in them, they urge that these preparations, the extract and the tincture, be authoritatively standardized, and they suggest a fixed standard.

At first sight this suggestion is calculated to commend itself to general acceptance, but I find myself less pleased with it the more I examine it, and I conclude that without a great deal more knowledge than I think any one is at present possessed of, any attempts to standardize the medical potency of extract of nux vomica must be fallacious. There is no doubt that a large portion of the medical activity of the drug does depend upon the alkaloids it contains, but I am acquainted with no proof that all the rest is inert. Neither am I aware that the effect of brucia upon the human subject as distinct from that of strychnia has ever been clearly ascertained. I incline to the opinion (though I advance it with some reserve) that no physiological experiments of the kind required have ever been made with *pure* brucia, that is, absolutely free from strychnia, and that, therefore little is really known of its medical value. If we are to standardize at all, we should standardize each potential element by itself, and not a mixture of elements, one of which is of undetermined power. As this is a point that appears to me of importance, I draw your attention to this table. It is, in chief part, a copy of one given by Messrs. Dunstan and Short showing the variations in alkaloidal strength of ext. nux vomica, as met with in commerce, and the varying proportions of the strychnia and the brucia that constitute these "mixed alkaloids." The column on the right is my own and is intended to show somewhat more strongly the variations in these proportions; the figures represent the proportion

of brucia to the 100 of strychnia. You will see that in the twelfth sample the two alkaloids existed in nearly equal proportions, or as 1 to 1, whilst in the eleventh sample the brucia was as over 1¾ to 1 of strychnia. I fear, therefore. that standardizing the extract by fixing its percentage of *mixed* alkaloids, with such contingencies before us, is misleading.

	Mixed alkaloids.	Strychnia.	Brucia.	Relative proportion of brucia to 100 of strychnia.
1	15·15	6·63	8·52	128
2	15·64	7·44	8·20	110
3	10·32	4·19	6·13	146
4	15·16	7·08	8·08	114
5	12·49	5·53	6·96	125
6	12·52	5·17	7·36	142
7	12·25	4·87	7·38	151
8	17·54	7·52	10·02	133
9	15·78	6·41	9·37	146
10	15·94	6·84	9·10	133
11	16·24	5·81	10·43	179
12	17·12	8·58	8·54	100

Having urged thus much against the general idea of standardizing, it may appear unnecessary to criticize the particular standard suggested by Messrs. Dunstan and Short. But doing so will serve to show another difficulty that would attend the practice. The percentage strength suggested by these gentlemen is 15; the sample before you, made with only ordinary care in the course of business in the laboratory of my own firm, contains 18 per cent. of the alkaloids. What am I to do with it to bring it to the required standard? Dilute it, perhaps, with spirit. Well, that would make it a clumsy soft mess to begin with, and it would soon dry up to its present condition of extra potency. Something else must be added to it; and that I should be sorry to sanction.

And if a sample comes out below the standard? Well, I suppose the batch must all be thrown away (for nothing in the form of alkaloid must be permitted to be added), unless, indeed, it be kept to dilute to the proper standard some future batch that turns out to be too strong.

I think considerations of the kind I have placed before you should make us hesitate before we endorse the final recommendations of Messrs. Dunstan and Short. We may thank them heartily for the good scientific work contained in their papers, but, I think, as prudent men, we should decline to follow them in assumptions that belong rather to other departments of medical authority than to that of pharmacy proper, and that are, to say the least, somewhat premature.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

A general meeting was held in the Society's rooms, on Wednesday evening, April 9. Mr. Preston, the President, in the chair.

The minutes of the previous meeting were confirmed.

The Secretary announced the following donation:—The *Pharmaceutical Journal*, from the Pharmaceutical Society.

The following gentlemen were elected members of the Society:—Messrs. J. H. Bradwell, W. Dutton, W. Clayton, John Clark.

A paper was read on—

A Plea for Botany.

BY G. A. GRIERSON.

Natural science of any kind is now recognized by all eminent authorities as being a most important factor in the training and development of the mind, and especially of that part of the mind wherein lie the powers of observation. In the words of one of our most eminent scientists,—"There is no object on which the youthful energy can be employed more worthily than in the pursuit of knowledge; no kind of knowledge can be more attractive than that which is presented by the works of creation; no source is more accessible; no fountain more inexhaustible; and there is none which affords, both in the mode of pursuing it and in its own nature, so complete or so beneficial a diversion from ordinary scholastic pursuits."

The advantages to be derived from botany may be looked at in two lights. First, from a naturalist's point of view, and, second, from a utilitarian's. Let us first listen to what the naturalist has got to say.

The famous aphorism of Lord Bacon,—"A little knowledge is a dangerous thing," has, I think, a noteworthy exception in the study of botany. For, surely, the little knowledge acquired from books by the dweller in a large town, which induces him to seek the country in order to put his knowledge into practice, is far from dangerous, either from an educational or from a physiological point of view. A science which for its study compels one to take long walks amid bracing air and refreshing scenery is surely not to be despised by him whose lot is cast in a large town amid the smoke and din of a money-making world, and who, but for an interest awakened in natural science, might never think it worth his while to leave the busy streets. Its action in strengthening and stimulating the physical powers is perhaps only equalled by its action on the mental. For quickening and developing the powers of observation I think there is no science can equal it, except, perhaps, zoology. The importance of the proper training and development of these faculties cannot be overestimated by anyone who aspires to the position of a cultured pharmacist, or, indeed, by the member of any profession, the complete success of which depends on observation and experiment. If these faculties were only better developed how many little points would be noticed in the business of every day which might lead to important results, for it is the acute observers and patient experimenters of past years who have placed technical knowledge in the position which it now occupies, and it is this technical knowledge, this applied science, which has given to England the position which she now occupies among other nations.

But besides these lasting advantages, consider the exquisite pleasure to be derived from the study of Nature. "A thousand wonders people the leaf; a museum of curiosities finds a home in the water drop; and the pleasure derived from a search in Nature's fields is one that no accident of life can mar, and no misfortune of existence take away." It is next to impossible for a thinking being to enjoy a ramble in the country or a sojourn by the seaside without a knowledge of the wonders which surround him on every side, and he who in some country ramble is questioned by some inquisitive youngster as to the name of some common plant will, I think, admit that even a little knowledge is better than none at all. Surely none of us aspire to the position of him of whom the poet sang—

> "A primrose by the river's brim
> A yellow primrose was to him,
> And it was nothing more."

Nothing, surely, could impress us more with the power of plants in calling forth the best feelings of our nature than a story which is related of Linnæus, the "father of botany." It is related of him that on landing in England, and passing a heath of yellow flowering gorse, he fell down upon his knees and thanked God for making, in the common road and field, flowers so beautiful.

Let us now look at our subject from a utilitarian point of view, and look first at the uses of plants themselves and then at the uses of the study of plants.

Plants play a very important part in the cycle of organic life. Under the influence of sunlight the chlorophyll of the leaf decomposes the carbonic anhydride of

the air, utilizing the carbon to build up its tissues, and giving back to the air the vitalizing oxygen. But for this wonderful provision the carbonic anhydride, which is continually exhaled from animals, would gradually accumulate in our atmosphere, and "the cessation of all vital phenomena" would merely be a question of time. But besides CO_2 plants absorb, from the air by which they are surrounded and the earth in which they grow, ammonia and water. These three substances are so acted on by the plant as to be converted into starchy and albuminous bodies, which we use as our daily food in the form of barley, wheat, oats, etc. The ligneous or woody portion of the plant, not being soluble in the human stomach, has to pass through an intermediate stage before we can use it as food. This intermediate stage is found in the herbivorous animals, such as the ox and sheep. These, from their great digestive powers, convert it into fatty matters, which reach us in the form of beef, mutton, etc., and are, I think, much appreciated, irrespective of the fact that their elements once existed in the form of grass. The influence which plants have on the rainfall of a country is, I think, too well known to require any comment.

Now let us look for a few minutes at the advantages to be derived from a study of those plants which play such an important part in the economy of Nature. "Nothing is more short-sighted than the *cui bono* cry of the ignorant against investigators in science. It is as short-sighted as the remark of Savarino, when he said:—'He who discovers a new dish does more for humanity than he who discovers a star,' forgetting that to astronomy we owe navigation." But exactly as navigation is an outcome of astronomy, or medicine an outcome of physiology and pathology, so is materia medica an outcome of chemistry and botany. We cannot expect to understand any science thoroughly without first grasping the principles on which it is founded. Now, materia medica is the science with which the experienced pharmacist is expected to be intimately acquainted, and this alone ought to be sufficient reason for botany commanding a larger share of attention than it does.

Professor Huxley, in speaking of the influence of science on the business of every day, says:—"As industry attains higher stages of its development, as its processes become more complicated and refined, and competition more keen, the sciences are dragged in one by one to take their share in the fray; and he who can best avail himself of their help is the man who will come out uppermost in the struggle for existence, which goes on as fiercely beneath the smooth surface of modern society as among the wild inhabitants of the woods." But some cynic may say, "We do not deny the advantages of chemistry and astronomy in the practical work of the world, but botany is only for those who have very little to do, and require some 'hobby' to keep them from moping." I should not for one moment think of refuting this by trying to show you all the benefits which have been conferred on the world by the study and application of the science of botany, simply because my knowledge is not extensive enough, and, besides, it would be rather beyond the scope of a paper such as this. But let us just glance at some of the benefits it has conferred on the science of medicine, with which we have the honour to be connected.

To enlist you in the cause of histological botany, I think it is only necessary to point you to the work done by Mr. Howard in the study of cinchona, and Schleiden in the study of sarsaparilla. But perhaps this is more the work of the specialist than of the ordinary pharmacist, time being an important factor in such investigations. Every pharmacist, however, is expected to know the difference between the leaves of such plants as belladonna, hyoscyamus, hemlock, stramonium, and such fruits as caraway, hemlock, dill, anise. Now, underlying all such knowledge, is a botanical principle, which must be understood before it can be applied. Is it not much more reasonable to get up the minutiæ of such knowledge from a study of the works of Nature than from mere book work? I think the most confirmed votary of practical business cannot but acknowledge that plants such as belladonna, hyoscyamus and hemlock are not only much more easily studied, but are much more interesting to study when growing "amid the wild magnificence of Nature," than when dry and lifeless they ornament the walls of a museum, or contribute to the profits of a pharmacy.

All materia medica books teem with botanical terms, and lead the student to think that botany is merely a science of hard names, a means to an end, not a study which can of itself yield both instruction and amusement. It is astonishing how easy the study of terms becomes, if there is only interwoven with it the element of practical work. The pleasure of finding out the name of some new plant by the correct interpretation of numerous hard terms, contained in the description of it, requires to be experienced in order to be appreciated. It is astonishing how a single success in commencing leads the aspiring student to explore further and further the "mine of Nature."

A very large portion of our materia medica is composed of plants not indigenous to our own country. Why is this? Probably one explanation is found in the fact that in warmer climates than our own the natural juices of plants are more thoroughly developed, as is the case with hemp. But I venture to think another reason is to be found in the fact that our native plants do not receive the study they merit from those who are, or should be, competent to make observations, and to deduce from these observations conclusions which might result in the introduction of many really valuable indigenous plants into our materia medica. Of late, several competent observers have come into the field, with the result that certain common wayside plants, known to the herbalist of old, but since discarded for want of more thorough investigation, have again been recognized as valuable from a therapeutical point of view. Dr. Quinlan, an enthusiastic worker in this field, has shown us the value of *Verbascum Thapsus* in phthisis, of the common plantain or ribwort as an astringent of no mean powers, and of *Galium aparine* or common goose-grass in the form of a poultice for ulcers; and quite recently the value of a yellow oil obtained from St. John's wort in the treatment of bedsores has been demonstrated by another worker in the same field.

But apart even from such motives as these, botany is worth studying if it were only for the glimpses it gives us of some of the internal workings of Nature. Like all other sciences, it is worth studying for its own sake, even if we could see no direct benefit to be conferred on the human race by its study. "All that science can achieve is a perfect knowledge and a perfect understanding of the action of natural and moral forces. Each individual student must be content to find his reward in rejoicing over new discoveries as over new victories of mind over reluctant matter, or in enjoying the æsthetic beauty of a well ordered field of knowledge, where the connection and the filiation of every detail is clear to the mind; and where all denotes the presence of a ruling intellect, he must rest satisfied with the consciousness that he too has contributed something to the increasing fund of knowledge on which the dominion of man over all the forces hostile to intelligence reposes."

Now that spring has got well advanced, we are almost in the midst of those innumerable gems in whose cause I have tried to enlist your sympathies.

"Scattered by Nature's graceful hand,
In briary glens, o'er pasture land,
The fairy tribes we meet;
Gay in the milkmaid's path they stand,
They kiss her tripping feet."

Few towns are so favourably situated for the study of

botany as Sheffield. It is in the centre of a district teeming with all orders of plants, and all that is wanted to secure them and obtain from them lessons to carry through life with us is a little time and inclination. The former element is generally rather a scarce one with chemists' assistants and apprentices, and so prevents the proper development of the latter; but the inclination, if present, will generally manage to find the time, even if at some inconvenience. At all events, let us cultivate the inclination, and perhaps "the powers that be" may gradually come to see that it is to their own interest to foster the spirit of scientific inquiry, and to grant a little more time for its due development.

A discussion ensued, and at the conclusion a hearty vote of thanks was awarded Mr. Grierson, on the motion of Mr. Thacker, seconded by Mr. Smith, for his interesting and instructive paper.

LIVERPOOL CHEMISTS' ASSOCIATION.

The twelfth general meeting of the thirty-fifth session was held at the Royal Institution, March 27. Mr. Edward Davies, President, in the chair.

The minutes of the previous meeting were read and confirmed, and the following donations to the Library were announced:—The *Canadian Pharmaceutical Journal*, from the Editor; The *Pharmaceutical Journal*, from the Society; The *Pharmaceutical Record*, New York, from the Editor, and the 'Thirty-first Annual Report of the Free Public Library and Museum and Walker Art Gallery, 1884,' from the Council of same, and a copy of the 'New Pharmacopée Française,' 1884, from Mr. A. C. Abraham, F.C.S.

A vote of thanks was passed to the donors, and Mr. Conroy moved, Mr. Parkinson seconded, and it was resolved:—"That a special vote of thanks be given to Mr. A. C. Abraham for his handsome donation to the Library."

The President stated that a complimentary dinner had been given to Mr. A. H. Mason, F.C.S., their late Vice-President, at the Stork Hotel, Queen Square, on Thursday, March 20, which was attended by forty-four gentlemen, and proved, in every way, a very gratifying success; also that Mr. Mason had that day sailed for Canada, bearing with him the best wishes of the Council and members of the Association.

Mr. J. C. Hornblower showed a lump of stone, weighing about 2 lbs., which had been found in an original package of gum assafœtida. The stone had evidently been faced with the gum and passed off as assafœtida.

Mr. Davies thought the stone was calcium carbonate.

Mr. Conroy said it was not at all an uncommon thing to find these stones as adulterants in packages of assafœtida, and he had known, in one instance, as much as 60 per cent. of the contents of an original package consisting of these stones. He considered they were indebted to Mr. Hornblower for drawing attention to the matter.

Mr. Parkinson drew attention to some oil of sweet almonds he had in his store, in which a sort of gelatinous matter was floating, and desired an explanation.

Mr. A. H. Samuel said it was no doubt mucilage, which was found in most vegetable oils, and was usually removed in the process of refining.

The President then called upon the Honorary Secretary to read the paper of the evening, contributed by Mr. M. Whitley Williams, of London, entitled,—

Notes on the Ammonia Process for Estimating Nitric Acid.

BY M. WHITLEY WILLIAMS.

Some four or five years ago I was led to make some experiments on the transformation of nitric acid into ammonia by observing, in the course of some analyses, very peculiar variations in the rate at which the nitric acid was reduced. The method I was employing was based upon the too little known fact, which we owe to Dr. Gladstone and Mr. Tribe, that zinc when coated with precipitated copper has its chemical activity so highly increased as to be able slowly to decompose distilled water at ordinary temperatures, a decomposition which results in the evolution of hydrogen and the formation of zinc hydrate. In presence of a dissolved nitrate the hydrogen is no longer evolved, at all events as gas, but the nitrate is reduced to nitrite and almost simultaneously the latter is transformed into ammonia.

When we consider that to do this we add nothing to the solution beyond a mere trace of hydrate of zinc, the reaction will obviously strike us as so singularly neat and clean (from a chemical point of view) as to offer peculiar advantages as a means of analysing nitrates. Provided always that it can be proved stoïchiometrically correct and can be made sufficiently rapid to be practicable.

To ascertain its stoïchiometric accuracy was my first care, and in this I was so far convinced of the completeness of the transformation as to feel satisfied that it was effected with much greater nicety than the methods of estimating ammonia permitted me to prove. A quantity of nitre sufficient to yield 1·685 parts of ammonia was successively by the most rigid method proved to yield 1·67, 1·69, 1·68, 1·69, 1·68, 1·68, 1·68, 1·70 and 1·67 parts of ammonia, a result which of itself is sufficiently creditable even to the methods of estimating ammonia.

It would take more time than I can now spare to conduct you through the experiments I made to ascertain the precise conditions under which the transformation takes place with the greatest rapidity. I cannot even now pretend to be master of them all, but so far as the usual necessities of the analyst are concerned, I believe the information obtained to be sufficient. Cold retards and heat greatly expedites the reaction; alkalies and particularly alkaline and earthy carbonates also retard it, while free carbonic acid or the merest traces of other acids make it proceed at a rate quite marvellously increased when we take into account the small amount employed. Thus, a nitre solution requiring about fifteen or twenty hours for complete reduction, in presence of carbonic acid was practically reduced in about two hours, while less than one-tenth per cent. of a mineral acid in solution completed the reduction in an hour.

But the most unexpected result was that small quantities of neutral alkaline or earthy salts had also an enormous accelerating influence. Thus one-tenth per cent. of sodium chloride about quadrupled the rate.

It is clear that with this information the analyst can at will obtain any reasonable rapidity desired. Let him use an elevated temperature, add either carbonic or other acid, or if he please a little common salt, or further still let him remove or decompose alkaline or earthy carbonates, and his reaction can be completed within an hour to a certainty. In the analysis of natural waters it is found that dissolved carbonate of lime has an extraordinary power of retardation. To transform this into an acceleration it is only necessary to add a little crystal of oxalic acid, the lime is removed out of the sphere of action and the liberated carbonic acid with any excess of oxalic acid then serves the most useful purpose.

Since I published an account of this work in 1881, the process has grown into much favour and has attracted much criticism, of which some little is naturally unfavourable; yet the general utility of the method has, I am happy to say, been invariably recognized, and I doubt not sincerely felt, and for a reason sufficiently well founded in human nature. The method is so easy. To estimate the nitrates, say in a natural water, place some strips of clean zinc foil slightly crumpled in a wide-mouthed stoppered bottle, about 1 square decimetre to 300 c.c. of the water, and cover it with a 3 per cent. solution of crystallized copper sulphate solution. When the zinc has acquired a copious black but firmly adherent coating of copper, the solution is drained off and the copper-coated zinc gently washed by covering it two or

three times with water. A portion of the water to be analysed is then poured on it to displace adhering distilled water and the bottle then nearly filled with it, the stopper inserted, any acid or salt added at the discretion of the analyst and the whole allowed to digest in a warm place till a little of the solution withdrawn gives no reaction of nitrous acid by Griess's metaphenylene diamene or naphthylamine test. The disappearance of the last trace of nitrous acid marks the end of the reaction. Or the analyst who does not care to trouble himself with testing may simply leave the digestion over a single night, feeling assured of a complete reduction in the morning. The titration of the ammonia is then made upon a measured volume of the fluid, diluted if necessary, or distilled, if the Nessler reagent produces an unavoidable turbidity as happens with some waters, particularly those containing much sulphates or certain other salts.

And here I would remark upon the extreme complexity of the conditions affecting the process termed familiarly *nesslerization*. Very few who use the process have reflected much about them, but many salts exercise influence, those even in the reagent itself affecting its sensitiveness and accuracy, while the proportion of oxide of mercury dissolved plays an essential part in the reaction. As a rule it may be laid down that the best conditions are those which most nearly approach to absence of all negative radicals save iodine and the maximum of mercuric oxide. Again, equality of temperature in the solutions is necessary, and I have observed that with the ordinary reagent the lowest temperatures appear to give the most delicately comparable tints.

I would further remark upon the very unsatisfactory nature of the glasses usually employed in this process. Seldom are two so exactly similarly "barrelled" as to show no difference when two apparently equally tinted fluids are transposed into each other's vessels. I have recommended for precise purposes, and always used, exactly cylindrical vessels made from glass cylinder with plate glass ends cemented with canada balsam, or clipped on.

These may be divided lengthwise into millimetres, and occasionally used for comparing the depths necessary to produce equality of tint. For the metaphenylene diamine estimation of nitrous acid this is peculiarly well adapted, and the results appear to suffer little or no error through the colour being produced in somewhat different strengths of solution.

Commenting on my method in the *Analyst* some time ago, Blunt has made a suggestion well worthy of trial. He suggests that in analysing a water containing lime a certain quantity should be treated with oxalic acid (say about $\frac{1}{20}$ per cent. A portion placed on the coppered zinc, and then instead of using distilled water for the comparison fluid, an equal quantity of the prepared water should be employed. In case of turbidity, he informs us that in this way an equal turbidity being produced in both fluids the determination is not interfered with.

And now my time is short and I cannot refer to some new work on the subject of nitric acid with which I have recently been engaged. It refers to the frequent presence of nitric acid in distilled water, which I believe to have traced by the aid of this process to its proper source. What that source is I must leave unsaid for the present, for I believe you would most unhesitatingly, and I think most properly, reject if I did not substantiate it with a suitable and detailed account of my work; but with your permission I will on a future occasion endeavour personally to show you by experiment.

Mr. A. H. Samuel, F.C.S., moved that a hearty vote of thanks be accorded to Mr. Williams for his valuable communication.

Mr. Ward, in seconding the vote, said he was much struck with the accuracy of the results obtained by the new method with such a small an amount of labour.

The discussion was continued by Messrs. A. C. Abraham and Conroy, and the vote was carried by acclamation, and the proceedings terminated.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The twelfth meeting of the session, being the Annual Business Meeting, was held on the evening of Wednesday, April 2, at 9.15. Mr. C. F. Henry, President, in the chair.

The minutes of last meeting having been read and confirmed, the Chairman called upon the Treasurer to read the financial statement, which showed an increase in the income from annual subscriptions of £1 19*s.*, a balance of £9 18*s.* 7*d.* being left in the Treasurer's hands.

The Assistant-Secretary then read the annual report, in which the Committee congratulated the Association on the gratifying increase of membership. Last year there was an increase of fourteen. This year the membership is further increased by seventeen. The number of members on the roll, last year being seventy-two, is now eighty-nine. It is worthy of note that the Association has almost doubled its membership in three years. Of those who joined the Association this session the larger number are apprentices, and it is hoped that this is a sign that an increasing number of candidates will become aspirants for the honours of the two prize schemes now conducted by the Association. The meetings were again held at fortnightly intervals, and the syllabus carried out in its entirety. All the papers had been contributed by members of the Association. A new and successful feature had been introduced, this session, in the form of papers on "Chemistry" and "Botany," intending to guide those preparing for the examinations of the Pharmaceutical Society. On two occasions the Association had been honoured by the presence and expressions of goodwill from members of the North British Branch. The open meetings held in November and January had been largely attended, showing how they were appreciated. The ordinary meetings, as a whole, had been well attended, and an increased desire to carry on the work of the Association had been shown by the members. A memorable event of this session had been the institution of the "Ainslie Pharmacy Prize," the outcome of the handsome gift of Mr. W. Ainslie. There are two prize schemes conducted by the Association, and the successful results of the examinations were a matter for congratulation. The finances of the Association continue in a most satisfactory state. The Committee recorded its indebtedness for most valuable assistance received from the esteemed Secretary of the North British Branch. The report concluded by expressing the hope that the Association will continue to make that satisfactory progress in the future which has distinguished it in the past.

The financial statement and report having been adopted, it was decided to forward £1 1*s.* to the Benevolent Fund of the Pharmaceutical Society.

A vote of thanks was heartily accorded to the retiring office-bearers and Committee.

The office-bearers and Committee for next session were then elected as follows:—President, Mr. W. S. Turnbull; Vice-President, Mr. J. R. Hill; Secretary Mr. W. Pirie; Assistant-Secretary, Mr. W. H. Duncan; Treasurer, Mr. J. B. Dunlop; Members of Committee, Messrs. Boa, Bowman, Hendry, Henry, Manson, Robbie, Robertson and Stephenson; and as Members of Prize Committee, in addition to the President, Vice-President and Secretary, there were elected Messrs. Boa, Henry and MacEwan.

After other business had been disposed of, the proceedings terminated.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association, held on April 9, Mr. C. Parkinson (President) in the Chair, a paper on "Operative Dentistry" was read by Dr. Albert J. Kutz, D.D.S.

After a few introductory remarks, the author alluded to the prevention and cure of "Caries," the great method of prevention being to keep the teeth clean; for this purpose the author recommended that the teeth be cleaned four times a day at least, once after each meal and thoroughly rinsing the mouth before retiring being necessary. In the morning a good tooth-powder should be used and after each meal the particles of food should be removed from between the teeth with a quill tooth-pick; metallic picks should not be used as they are liable to damage the enamel. The best method of applying the tooth-brush was then described, and the occasional use of a silk thread with powder on it and drawn between the teeth was recommended. The process of filling or stopping teeth was then given in detail. The materials used for stopping were next mentioned, gold being specially alluded to; the two kinds of gold in use being the adhesive and non-adhesive. The gold is supplied to the dentist in the form of leaves of various thickness and also in soft spongy masses called crystalline or sponge, plastic and shred, all of which are very adhesive. Cohesiveness is the name given to that quality of gold, by which one portion by pressure becomes so incorporated with another as to make a mass about as solid as coin. The author then mentioned the cases in which adhesive or non adhesive gold was the most preferable for use, giving the reasons.

A discussion followed, in which the President, Messrs. Axford, Carter, Cracknell and Millhouse took part.

A vote of thanks to Dr. Kutz terminated the proceedings.

Parliamentary and Law Proceedings.

Prosecutions under the Pharmacy Act.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN *v.* MAY.

At the Edmonton County Court, before J. T. Abdy, Esq., LL.D., Judge, on Tuesday, April 8, the Council of the Pharmaceutical Society of Great Britain sued R. May, of Ponder's End, to recover two penalties of £5 each, first for keeping open shop for the retailing, dispensing or compounding of poison, and second for taking, using or exhibiting the name, style or title of "chemist," contrary to the provisions of the Pharmacy Act, 1868.

Mr. Wallace, instructed by Messrs. Flux, Son and Co., appeared for the Society. Mr. Avery, solicitor, appeared for the defendant.

It was admitted by defendant's solicitor that defendant had sold poison and used the title of "chemist," thereby incurring the penalties sued for, and he only addressed the Court with reference to defendant's character.

His Honour held that he had not to take into account the defendant's character. Defendant had incurred the penalties sued for, and he gave judgment for the plaintiffs accordingly,

And upon application, His Honour held that the case was one of public interest and for the public benefit, and therefore gave judgment for plaintiffs with costs on the higher scale.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN *v.* BLYTHER.

At the Edmonton County Court, before J. T. Abdy, Esq., LL.D., Judge, on Tuesday, April 8, the Council of the Pharmaceutical Society sued G. F. Blyther, of High Road, Tottenham, to recover two penalties of £5 each, first for keeping open shop for the retailing, dispensing or compounding of poison, and second for taking, using or exhibiting the name, style or title of "chemist," contrary to the provisions of the Pharmacy Act, 1868.

Mr. Wallace (instructed by Messrs. Flux, Son and Co.) appeared for the Society. The defendant did not appear.

Evidence was given that a prescription which contained "strychnia" was made up at defendant's shop on the 15th ult., that upon the bill in which the bottle was wrapped were the words, "Sold by Wall, Family and Dispensing Chemist, High Road, Tottenham," and that there appeared over defendant's shop the words, "Blyther, successor to the late W. J. Wall."

Proof of the death of Mr. W. J. Wall having also been given, and that there was no chemist of the name and address of "Wall, High Road, Tottenham," His Honour gave judgment for the plaintiffs for the two penalties with costs on the higher scale.

Poisoning by Prussic Acid.

An inquest was held at Northallerton on the body of Dr. Henry Brown, on April 12. Mrs. Brown, the wife of the deceased, stated that on Thursday evening she left him in the surgery, writing. As he did not return she sent for Dr. Richmond, who paid a visit to the surgery, on pretence that he wanted to borrow a syringe. Dr. Brown said he would return home in a quarter of an hour. Dr. Richmond said that later in the evening he was standing in the street, and saw Dr. and Mrs. Brown walking arm in arm. After midnight he was called out of bed by Mrs. Brown, and proceeded at once to her residence. He found Dr. Brown lying on the sofa, breathing heavily. He instructed them to send for another medical man. He put his fingers down Dr. Brown's throat to make him vomit, but failed. His eyes were fixed. He detected a strong smell of prussic acid. He applied the stomach pump, and washed the stomach out. The fumes of prussic acid were so strong that he had to turn his head away. Dr. Brown died at half-past twelve o'clock. He (Dr. Richmond) sent for the police. He found upon the mantelpiece a bottle of prussic acid. He went with the police-constable to Brown's surgery, and found the letter that he had been writing. The terms of the letter left no doubt that the writer was insane. The cause of death was poisoning by prussic acid. Inspector Beswick gave confirmatory evidence, and the Jury returned a verdict in accordance with the medical evidence.—*Leeds Mercury.*

ANSWERS TO CORRESPONDENTS.

Erratum.—On p. 812, col. ii., line 14 from top, the name of the speaker should be "Mr. Gravill," instead of "Mr. Hadfield."

F. Moore is recommended to experiment with some varieties of "aniline blue" until he obtains the shade that he requires.

Mr. McBeath is thanked for his communication.

A. E. I.—We have never heard of the existence of such a poisonous principle and should be inclined to believe that a mistake has been made. With respect to the proprietary article mentioned we know of no other means of ascertaining its composition than by analysis.

David.—*Vaccinium Myrtillus.*

Omega is recommended to consult a solicitor.

H. P. F.—If we have been successful in deciphering your handwriting, the phrase appears to be a quotation from a well-known litany, and with a moderate knowledge of Latin there should be no difficulty as to its translation.

Communications, Letters, etc., have been received from Messrs. Hocken, Yewdale, Symes, Edwards, Moderate Apprentice, J. W. P., X. Y. Z.

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Baden Flesh Gloves, or Calefacio No. 2 (hard brown—friction)	6/
Baden Flesh Gloves, C quality (soft brown—friction)	5/4
Paragon Bath Gloves (soft brown, with red and white stripes)	6/8
Union Bath Gloves, No. 1 (one side stout white, and the other side best soft brown)	7/
Union Bath Gloves, No. 2 (one side white honeycomb, and the other side hard brown)	7/
Brighton Bath Gloves (white honeycomb)	5/
Roman Bath Gloves (cream or unbleached white, stout elastic honeycomb)	6/
Ottoman Bath Gloves (fancy brown and white—friction)	6/8
Criterion Bath Gloves (fancy brown and white)	6/8
Albany Bath Gloves (fancy white linen)	6/8
Princess Washing Gloves (fancy pink and white honeycomb)	4/
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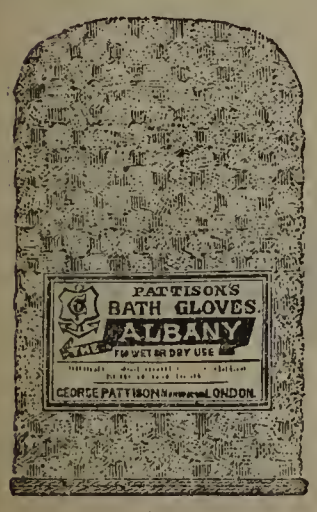

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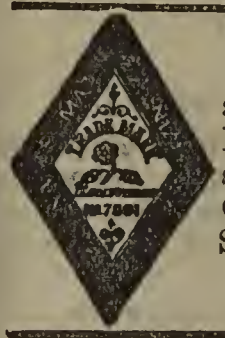

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TESTIMONIAL.
Buckley House, Llandudno,
March 10th, 1884.
Gentlemen,
Your excellent system of College training and valuable Postal Lectures have gained a well deserved repute, yet I gladly testify to the entire satisfaction I have felt in going through both one and the other.
Your course of teaching is so thorough, and your efforts to assist and wisely direct every student so unremitting, as to call for the highest praise.
I am, Gentlemen,
Yours very truly,
M. A. S.
The original of this and numerous other Testimonials may be seen at the Office.
For full particulars apply to Messrs. Wills & Wootton, Trinity Square, London, S.E.

STUDENTS' AIDS TO EXAMINATION.
PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. Minor.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, Gratis. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, Chemist, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

London Homœopathic Hospital Medical School, Great Ormond Street, Bloomsbury.
Dr. Dyce Brown will resume his Lectures on the Practice of Medicine on Friday, May 2nd, at 5 p.m., and will continue them every Tuesday and Friday throughout the Summer Session.
Dr. Compton Burnett will Lecture on Materia Medica on Thursday, May 1st, at 4 p.m., and continue to do so every Monday and Thursday throughout the Summer Session.
Clinical Lectures and Instruction in the Wards and Out-Patient Department of the Hospital are given by members of the Staff.
Full Particulars may be obtained from the Honorary Secretary of the Medical School, Dr. Lloyd Tuckey, at the Hospital; or from
April, 1884. G. A. CROSS, Secretary.

CONCILIO ET LABORE.
THE MANCHESTER
COLLEGE OF PHARMACY,
225, OXFORD STREET, MANCHESTER.
At the Minor Examination held in Edinburgh, **Three** Students from this School entered. **All** passed, viz:
Mr. W. Aspinall, Wigan.
„ E. Barlow, Oldham.
„ F. Riddiough, Keighley.
Note.—All Classes for July begin on Monday, 21st.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY.

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

Chemistry:

MR. A. P. LUFF, B.Sc., F.I.C., F.C.S., F.L.S.

Botany, Materia Medica, &c.:

MR. J. WOODLAND, F.L.S., F.C.S.

Demonstrator:

MR. F. H. ALCOCK.

The next complete Course of Lectures and Classes will be commenced on April 28th.

FEE TO THE JUNE EXAMINATION ... £6 6
„ JULY „ ... 8 8

For Prospectus, &c., apply to

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WESTMINSTER COLLEGE

TRINITY SQUARE, LONDON, S.E.

The next Course of Lectures and Classes for Minor Students will commence on Monday, April 28th.

The next Course for Major Students May 1st.

FEES—MINOR OR MAJOR.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

June Exam. ... **£5 5s.** **July** ... **£7 7s.**
December ... **£10 10s.** **12 Months £15 15s.**

BOARD AND APARTMENTS FOR STUDENTS.

In order to secure the comfort of Students during their stay in College, Mr. Wills (Principal) provides a limited number of Students with comfortable and conveniently situated Apartments. Such Students meet for meals at Mr. Wills' Private Residence, Gladstone House, St. George's Road, Southwark. **Terms, Four Guineas per Month.**

EVENING LECTURES,
Laboratory Instruction and Classes.

Gentlemen engaged during the day, and unable to leave business, may be prepared for the Pharmaceutical Examinations in the evening.

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SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing Sept. next.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS
(*From the Royal School of Mines*),
6, ROCHESTER SQUARE, CAMDEN ROAD, N.W.

As each Student is taught and works *separately*, entry may be made at any time. Individual personal attention. No Demonstrators. Postal teaching. Enclose stamp for terms, &c.

LABORATORY CLOSE TO GOWER STREET STATION.

LONDON MATRIC.

Legal, Medical, Pharmaceutical, and Exams.

BUTLER SMITH, B.A., 1st B.Sc. (Lond.), assists PUPILS in reading up, day and evening.
POLYTECHNIC, REGENT STREET, W.

LIVERPOOL
SCHOOL OF PHARMACY.
36, OXFORD STREET, LIVERPOOL.

Principal: J. S. WARD, Ph. Ch., M.P.S.
(*Prize Medallist and South Kensington Prizeman*).

Owing to the continued success of this School it has been found necessary to enlarge the premises and fit up an entirely new laboratory.

For *Systematic Botany* the authorities have kindly given permission for full use of the *Liverpool Botanic Gardens.*

A new Prospectus, with full particulars of the school premises, curriculum, fees and testimonials, will be forwarded on application.

ENGAGEMENTS WANTED.

AS JUNIOR in London. Age 21. 5 years' experience. Good references. Services in return for board and lodgings, with time for study. CHEMICUS, 3, Viewforth Pl., Dundee.

TEMPORARY. Ætat 31. Town or country. By day or week. Thoroughly experienced in all branches. Irreproachable references. Terms moderate. Disengaged. A. WOOD, 7, Woodfield Cres., Harrow Rd.

AS Junior ASSISTANT. Age 20. 5 years' apprenticeship. 6½ years' experience. Passed Preliminary. Good references. G. H. A., Grammar School, Stow-on-the-Wold.

BY a young man, aged 22, in London, where time would be allowed for study for the Minor exam. Small salary required. ALPHA, Medical Hall, Yeovil.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow, is now booking dates for summer engagements. At liberty April 28th until May 30th.

AS ASSISTANT, in London. Minor qualification. Age 21. Height 5ft. 7in. 5 years' London experience. Disengaged. W. G. SAPSED, Watton, Herts.

AS ASSISTANT. London preferred. Where one or more are kept. Age 24. 7 years' experience in Dispensing and Retail trade. Height 5ft. 11in. A. S. B., 10, Vine St. Buildings, Tooley St., S.E.

LOCUM TENENS or Temporary ASSISTANT. Qualified. By the day, week or month. Town or country. CHEMICUS, 51, Judd St., St. Pancras, W.C.

ASSISTANT.—Shropshire or West Midlands preferred. Well up in Counter Work and Dispensing. Age 22. 4 years' good experience. Disengaged. ALPHA, 16, Richmond Rd., Handsworth, Birmingham.

AS ASSISTANT. Permanency. Out-door preferred. Good Counterman and Prescriber, mixed country, where dentistry can be thoroughly introduced (registered Dental Surgeon). Disengaged 22nd inst. ABSTAINER, Montague Pl., Richmond, Surrey.

AS MANAGER. London and provincial experience. Competent Dispenser and Prescriber. Qualified by exam. Permanency desired, or temporary till otherwise suited. Disengaged April 27th. Age 37. MANAGER, 96, Marchmont St., W.C.

AS MANAGER. Good Prescriber and Tooth Extractor. Excellent references. Over 6 years with present employer. Total abstainer. Registered. Age 37. Married. J. STARK, 43, Kellett Rd., Brixton.

EVENING EMPLOYMENT by a young man, aged 24, competent and of good experience, who is also open to full or partial Sunday duty. Terms moderate. A. H., 7, Blandford Pl., Regent's Pk., N.W.

ENGAGEMENTS WANTED.

ADVERTISER wishes a situation in a Wholesale Drug establishment. 6 years' Retail, and a little Wholesale, experience. Age 21. Height 5ft. 8in. H. C., 30, High St., Aldershot.

EARLY in May.—Senior or Front COUNTERMAN. West-end preferred. In or out-door. Age 26. Minor. 9 years' experience. Good references. J. Mc., 195, Brompton Rd., W.

AS WAREHOUSEMAN or COUNTERMAN in Wholesale Drug trade. Over 5 years as porter in Retail. In or near London preferred. Disengaged by April 28th. M. T., 133, Praed St., London, W.

NEXT month, as ASSISTANT, city or near to. Out-door preferred. Age 23. 7 years' experience town and country. Accustomed to good class Dispensing business. A. J. M., Messrs. Brown, Sheldon St., Paddington.

ASSISTANT, well recommended and thoroughly competent. Minor qualification. Good London experience. Age 25, tall, good address. Speaks French. Out-door preferred. Mr. LONGSTAFF, 40, Berwick St., Pimlico.

AS out-door ASSISTANT. Married man. No children. Age 25. Good Dispenser, &c. Moderate salary. R., 42, Hughenden Ter., Leyton Rd., Stratford, E.

LOCUM TENENS.—By a gentleman, to take charge during illness or absence. Or Dispenser to a Surgeon. DELTA, J. M. Earle, 5, Victoria Grove, Kennington.

LOCUM TENENS.—W. C. TAYLOR, 68, St. Stephen's Avenue (from Loftus Rd.), Shepherd's Bush, is open to an immediate engagement in town or country. Moderate terms and excellent references.

AS JUNIOR. In good-class London business. Age 22. Minor qualification. Or good country business near London would be considered. Disengaged. CHEMICUS, 149, Marylebone Rd., London, N.W.

ASSISTANT, MANAGER of Branch or DISPENSER to Surgeon. Out-door preferred. Ætat 25. Heigh 6ft. 10 years' experience. Good Prescriber and Tooth Extractor. CHEMICUS, 130, High St., Guildford.

FOR first week in May.—As JUNIOR. Height 5ft. 9in. Age 21. 5 years' experience. Good references. Suffolk or Essex preferred. FIDELIS, Mr. Althorp, 50, Narrow St., Peterborough.

AT once.—As ASSISTANT or MANAGER (Minor). Good Dispenser and Prescriber. Can Extract Teeth. No objection to outdoor. 11 years' experience. Age 26. M., 126, Clapham Rd., S.W.

BY a student.—Employment as ASSISTANT or DISPENSER for about 6 hours daily, or out-door situation with short hours. R. M. L., 15, Trinity St., Boro'.

AS JUNIOR, in good London house. Out-door preferred, with a little time for study, if convenient. Age 21. Height 6ft. Good references. G., 20, Victoria St., Swindon.

BY a Married Man (35), Minor by exam., as MANAGER or as TOWN TRAVELLER, long experience. London preferred. CHEMIST, Mr. Treatt, Messrs. Hodgkinson & Co., Whitecross St., London.

AS Improving ASSISTANT. Hastings preferred, but not essential. Ætat 25. 2½ years with Surgeon. Six months Retail. Good references. Photo. Disengaged 1st May. CHEMICUS, West Hill Pharmacy, Hastings.

ADVERTISER, aged 28 years, qualified, with the highest possible references, desires an engagement in London as SENIOR or MANAGER. 13 years' experience in first class Dispensing and Retail pharmacies. B. M.W., 149, Marylebone Rd., N.W.

AS TEMPORARY, or Manage a Branch. Registered. Good references. A. B., 11, Woolwich Rd., Belvedere.

ENGAGEMENTS WANTED.

AS Assistant in Laboratory. Age 24. Minor qualification. Chemist, Melrose House, Cambridge Gardens, Hastings.

AS Assistant, with a view to succession or otherwise, in a good class business. Town or country. Thoroughly competent. Good references, &c. Age 26. Delta, 13, Landsdowne Ter., Walter Rd., Swansea.

AS Assistant, for two months, with time for reading. G. Duncan, The Vine, Sevenoaks, Kent.

AS Assistant. With time for study. Good references. Disengaged. C. D., 2, Falmouth Rd., Borough, S.E.

OUT-door preferred. Age 32. Height 5ft. 5in. 17 years' Retail experience. Prescribe and Extracts Teeth. Apothecaries' Hall qualification. Dentist, 21, Queen's Walk, Nottingham.

AS Assistant in Dispensing business. 10 years' experience. Height 5ft. 9½in. London preferred. Used to long hours, but would require two evenings per week to attend lectures. J. R., Mr. West, 17, Strand, Dawlish.

AS Junior in Dispensing business, London or Suburbs. Time for study preferred. 7 years' experience. Age 21. Height 5ft. 6in. Disengaged. W. R. W., 10, Ropemaker St., Finsbury, E.C.

AS Junior. In a good class Dispensing business in London about beginning of May. In- or out-door. Age 22. 5 years' experience. Chemicus, 1, Claremont Rd., Surbiton.

OUT-DOOR Assistant or Manager. Country preferred. Minor and Hall qualification. 12 years' experience. Good references. A. P. S., 14, Tavern St., Ipswich.

AS Manager. Married. Age 30. Minor qualification. Registered Dentist. Would take temporary. K., 7, Capworth St.. Leyton.

AS Dispenser to Surgeon or Public Institution, or Assistant to Chemist. Part or whole time. Abstainer. Age 23. 8 years' experience. Accurate and quick. X., 45, Swan St., S.E.

PERMANENCY.—5 years' experience (town and country). Salary £50 out-door. Good references. Abstainer. Wholesale or Retail. H. J. Paske, Summer Hill Ter., Bath Rd., Bristol.

IN Wholesale house, with view to Travelling. Salary a secondary consideration to commence with. E. H., care of Mr. Fisk, Chemist, Camberwell Pharmacy, London, S.E.

AS Assistant. Age 24. Height 5ft. 10in. Over two years in last situation. Yorkshire preferred. Chemicus, 4, Byland Ter., Malton, Yorks.

MANAGER, with view to purchase, in a Family and Mixed country business. London and provincial experience. Chemicus, 12, Crowndale Rd., Camden Town, London.

ASSISTANTS WANTED.

A THOROUGHLY competent Assistant, who has had experience in first-class Retail and Dispensing. Commencing salary £50, in-door. Apply, with full particulars, enclosing carte, to J. Clarke, Pharmaceutical Chemist, Croydon.

A COMPETENT Assistant, out-door, for the country. Trade chiefly retail and heavy goods. Salary 30s. weekly, and a small commission. State references and reasons for leaving last situation. A pushing young man may find this a permanent situation. Name qualification (if any), and address J. Morton, Ramsbottom, Manchester.

ASSISTANTS WANTED.

JUNIOR Assistant, where one only is kept, in a fashionable watering place, South Devon. Time allowed for study. State age, height, references, salary, &c. Send carte (which would be returned). Apply to E. R. West, 17, Strand, Dawlish.

A GOOD Junior or Improver, for a Dispensing and Family business. Apply, stating age, height, salary (in-door), and reference, to John Newcome, Chemist, Grantham, Lincolnshire.

AN Assistant, about 21, accustomed to good class Retail and Dispensing business. Hours 8 to 7.30. State full particulars and salary required to Frost & Cope, Pharmaceutical Chemists, Derby.

A JUNIOR Assistant or Improver. In-door. One accustomed to light Retail and Dispensing business. Apply, stating age, height, references, experience and salary required, to E. Brown & Son, Chemists, Hyde Park, Leeds.

MR. T. H. HURLE HOBBS, Pharmacist (exam.), Kirkdale, Sydenham, offers to a Junior Assistant, of gentlemanly appearance and good address, a comfortable home with private tuition for the Minor examination in lieu of salary.

AN active Junior Assistant, with Minor qualification, of gentlemanly appearance and good address, accustomed to first-class Retail and Dispensing business Apply to Mr. Hall, West Cliff Pharmacy, Folkestone.

A TURNOVER or Junior Assistant. Plenty of time allowed for study. A. E. Pride, Old Basford, Notts.

AS Junior (out-door). A quick Dispenser and good Counterman. Gentlemanly appearance and used to Prescribing. Apply, L. F. Edisbury, The Pharmacy, Wrexham.

SHORTLY.—Where three assistants are employed, a Junior, qualified by examination. Must be well up in Dispensing and the routine of a first-class business. Address, with fullest particulars, enclosing carte (to be returned), to W. H. A., care of Messrs. Hodgkinsons, 198, Upper Whitecross St., E.C.

ASSISTANT, age about 24 years. An accurate Dispenser, a good Prescriber, trustworthy and steady, gentlemanly and obliging. Unexceptionable references required. Salary, in-door £35; out-door, for summer months, £85. One desiring permanency preferred, also an abstainer if possible. Address, S. M., care of L. H., 48, Warlock Rd., Paddington.

IMMEDIATELY.—A thoroughly competent Assistant, to Manage a Branch. Character must bear strict investigation. Comfortable place for a good business man. Furnished apartments. Apply H., Messrs. Davy, Yates & Co., 64, Park St., Borough.

IMMEDIATELY.—In a fashionable suburb of London. A good Junior Assistant, for a first-class Dispensing business. Age about 23. Two kept. State full particulars to C. Lowe, Pharmaceutical Chemist, Surbiton, S.W.

BY a West-end Chemist.—An Assistant. One who is a reliable Dispenser and obliging Counterman, and who seeks a permanent situation. Domestic arrangements unexceptionable. Apply, with carte (to be returned), stating age, height, salary required and references, to S. S., Messrs. Herrings, 40, Aldersgate St., E.C.

ASSISTANT for China. Must have passed the Minor examination. Good prospect for a qualified man, not under 24. Engagement for 4 years. Address full particulars to A. A. Campbell & Co., 34, Leadenhall St., London, E.C.

A THOROUGHLY competent Assistant, from 25 to 35 years of age. Must be gentlemanly, and good address. Apply, enclosing carte, to J. Hill, 1, Castle St., Reading.

ASSISTANTS WANTED.

AN ASSISTANT, of good experience, must be thoroughly reliable and well recommended, from 22 to 25 years of age, for the Dispensing Department, and to assist at the Retail, in a West-end house where several assistants are kept. Salary about £50 per annum. Address, W., care of Messrs. Maw, Son & Thompson, 11, Aldersgate St.

OUT-DOOR ASSISTANT, for Mixed trade. One with knowledge of Oils and Colours preferred. Good character indispensable. Apply, stating full particulars, and enclosing carte, to WM. FOX & SONS, 109 & 111, Bethnal Green Rd., London.

WHOLESALE.—Experienced ASSISTANT for Wet Counter. Must be well recommended. For house in Edinburgh. £80 to £100. Apply, stating age, experience, &c., to ALPHA, Messrs. Meggeson & Co., 14, Miles Lane, London, E.C.

AN ASSISTANT, age about 23 or 24, well up in Dispensing and general Retail. Apply, stating salary previous engagements and full particulars (personal application preferred), to THOS. W. HORSLEY, Pharmaceutical Chemist, 274, Portobello Rd., North Kensington, W.

MESSRS. PROVOST & COOK, 94, Terminus Rd., Eastbourne, require at once a Senior ASSISTANT, age not under 24. Good references indispensable. Three kept. Full particulars to be sent as above.

IMMEDIATELY, for the South of France.—For a first-class business, an ASSISTANT well up in Dispensing and accustomed to light Retail. Age from 24 to 30. Preference given to one speaking French. Engagement for 3 years. Send carte and full particulars to JAS. ALDERTON, Jun., Finstock, Charlbury, Oxon.

IMMEDIATELY.—A married man, as MANAGER for Branch. Mixed business. One who would be likely to purchase business preferred. House, rent free. Apply, stating salary required, to G. KEMP, Chemist, Bridge St., Chester.

MANCHESTER.—WRIGHT & BARNABY, Pharmaceutical Chemists, 223, Oxford Street, require an indoor ASSISTANT, about 25 years of age, with Minor qualification, who has had recent practical experience in a Dispensing business. State age, height, salary, when at liberty, and enclose carte (to be returned).

A COMPETENT ASSISTANT. In-door. About 23 or 24 years of age. State references from last two situations, salary and age, with full particulars, to CHAS. JONES, Pharm. Chemist, Birkenhead and Tranmere.

A. P. GARLAND, Pharmaceutical Chemist, requires a thoroughly practical man to Manage his Blackpool Branch. Must be well up in Prescribing and Dispensing and able to Extract Teeth. None need apply whose antecedents will not bear the strictest investigation. Address, with particulars, A. P. GARLAND, Blackburn.

IMMEDIATELY.—A competent ASSISTANT, for a first-class business. Minor qualification. Must be a neat and accurate Dispenser and good Counterman. In or out-door. State age, height, salary required, and enclose photograph, to ARTHUR I. JOSEPH, St. Leonards-on-Sea.

A JUNIOR, in a Surgeon's Retail and Dispensary. West of London. Chiefly for Dispensing and Retail. Out-door. Apply by letter only, stating age, experience, salary required, &c., to F., 99, Sutherland Gardens, W.

ANALYST.—A gentleman to superintend the Analytical Department of a large Wholesale Manufacturing Pharmaceutical Chemist's business. Apply, with reference, stating age, qualification, experience, and salary required, to ANALYST, Wm. Edwards & Son, 157, Queen Victoria St., London.

ASSISTANTS WANTED.

APRIL 28.—St. Leonards.—Gentlemanly ASSISTANT, about 24, well accustomed to first-class Dispensing business. Apply, with carte and usual particulars, to JAMESON & CURTIS, Hastings.

AN in-door ASSISTANT, not under 23 years of age, accustomed to light Retail and Dispensing. Apply, stating age, height, salary required, &c., to P. HALL, 118, Grey St., Newcastle-on-Tyne.

SOUTHPORT.—Immediately.—A JUNIOR, out-door, for light Retail and Dispensing. Hours 8 to 8.30; Saturday 10. One evening from 6. Usual particulars to J. JOYE, A.P.S., 30, London St., Southport.

A JUNIOR ASSISTANT (for the season), in-doors, of gentlemanly appearance and good address, and accustomed to a good-class Dispensing business. Apply personally, or if by letter, with carte and full particulars, and state salary required, to E. C. PERKS, 1, Sloane Sq., London, S.W.

CRAFTON & SON, Croydon, require a competent ASSISTANT at once. Personal application preferred.

SENIOR ASSISTANT. Out-door. No Sunday duty. Apply personally at 143, Hackney Rd.

JUNIOR. For the early part of May. Steady and industrious. One accustomed to an Agricultural and Mixed business preferred. State age, height, salary, and experience. Send carte (to be returned). GRIFFITH, Market Pl., Hadleigh, Suffolk.

A JUNIOR ASSISTANT. One accustomed to Dispensing and first-class Retail business. Personal interview preferred, otherwise carte (which shall be returned), stating full particulars, age, height, salary, &c, to SYDNEY ROGERS, Osborne Rd., Southsea, Hants.

A COMPETENT in-door ASSISTANT, not under 23, for a first-class Retail and Dispensing establishment. Short hours. Address, stating age, height, salary and references, also carte if convenient, to PHARMACIST, care of Messrs. Meggeson & Co., Miles Lane, London.

AN ASSISTANT (Minor), under 30, unmarried. Salary £90 per annum. Out-doors. A.B., care of Mr. Pitts, Prince of Wales Rd., Norwich.

APPRENTICE.—Vacancy occurs in old established Family and Dispensing business. Every facility will be given for thoroughly learning the business. Pleasant healthy neighbourhood, outskirts of Liverpool. Premium required, large portion of which will be returned as salary. W. X., Rowand & Co., Wholesale Druggists, Liverpool.

IMMEDIATELY.—A competent ASSISTANT, in-doors. Must have passed the Minor examination and be a quick and accurate Dispenser. One seeking a permanent situation preferred. Apply, with all particulars as to references, height, age, &c., to J. A. SPARGO, Chemist, 1, Pier Ter., Lowestoft.

MIDDLE of May.—Competent ASSISTANT, age about 25. One accustomed to Surgeon's Dispensing. State full particulars to J. VIVIAN WILLIAMS, Chemist, Plymouth.

SENIOR ASSISTANT, about 28, from May to August. Tall, obliging, able to Prescribe, Extract Teeth, and take entire charge, as the principal is leaving for his health. Salary £4 10s. per month, board, lodging, and comfortable home. First-class references required. CHEMIST, 6, Abney Park Ter., Stamford Hill, N.

A JUNIOR ASSISTANT or IMPROVER, at once, out-door, in light Mixed business. Usual particulars to B. W. PRICE, Medical Hall, Wigan, Lancs.

A COMPETENT ASSISTANT, about 23 to 25 years of age. Must be of good address, accustomed to good Retail and Dispensing. Apply to S. O. S., Messrs. Wright, Layman & Umney, 50, Southwark St., London, S.E.

ASSISTANTS WANTED.

DRUG Mills.—A man who has had experience in a Drug Mill and who is willing to make himself generally useful in a Laboratory. Apply, with references and other particulars, to A. B. C., care of Messrs. Horner & Son, Mi.re Sq., Aldgate, London.

A JUNIOR ASSISTANT, desirous of time for study in lieu of part salary. Apply, if by letter sending carte and full particulars, to H. J. LANGHAM, 74, Mountgrove Rd., N.

IMMEDIATELY.—IMPROVER or Junior ASSISTANT, in-door, obliging, with good business habits, and willing to make himself generally useful. State age, references, and salary required, to JAMES STEVENS, 19, High St., Strood, Kent.

MESSRS. WILLIAMS & ELVEY, 8, Halkin St. West, Belgrave Sq., require an ASSISTANT, about 25 years of age, with Minor qualification.

HAIRSINE & CO., 47, Haymarket, London, require an ASSISTANT, about 24 years of age, with Minor qua'ification.

C. BRIDGES, Pharmaceutical Chemist, 24, Sloane St., Belgravia, is in want of an ASSISTANT, accustomed to first-class Dispensing and Retail.

AN ASSISTANT, of good address and experience, with active business habits. Apply (personally preferred) to W. MALDEN & Co., 195, Brompton Rd. (near South Kensington Museum), London, S.W.

IMMEDIATELY.—A Junior ASSISTANT, of good address and gentlemanly appearance. Apply, stating age, height, salary required, and when disengaged, to ALLEN & LLOYD, Chemists, Aldershot.

IMMEDIATELY.—A qualified ASSISTANT, aged about 22 or 24 years. Must be a good Dispenser. One only kept. Apply, with full particulars, to R. S. DAMPNEY, 87, Abingdon Rd., High St., Kensington.

BY a Chemist's Widow, at once, a competent and qualified ASSISTANT, to have sole management of business. Apply, stating age, salary, &c., to Mrs. W. MARTIN, Chemist, Market Harborough.

IMMEDIATELY.—A competent ASSISTANT, not less than 25 years of age, accustomed to good class Retail, Dispensing and Prescribing. If able to Extract Teeth preferred. Address, with full particulars, enclosing carte (to be returned), stating age, height, and salary, W. B., Messrs. Maw, Son & Thompson, Aldersgate St., London, E.C.

FOR large Dispensing business in the West of England, where two others are kept, an efficient SENIOR, of good address. Apply to Mr. AKERS, care of Maw, Son & Thompson, Aldersgate St., London.

AN ASSISTANT, about 22 years of age, for a good Retail and Dispensing business. No heavy trade. Apply, with full particulars, to G. T. GREEN, Chemist, Godalming.

A COMPETENT ASSISTANT, of good address, for suburban Retail and Dispensing business. Age 22 to 24. With qualification preferred. Apply, stating experience and salary required, in-doors, to FRANCIS CARTER, Pharmaceutical Chemist, High St., Carshalton, Surrey. A vacancy for a well educated youth as APPRENTICE.

BUSINESSES FOR DISPOSAL.

NORTH Wales.—A general light Retail and Prescribing BUSINESS, in a favourite seaside resort. Established 33 years. Full prices. Returns have exceeded £600. Scope for increase. Rent £30. Price £250. To a gentleman of limited capital such an opportunity of securing a competence rarely offers. CHEMIST, Wilson House, Goosegate, Nottingham.

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A PHARMACEUTICAL Chemist, age 29, whose present business is too small, would be glad of an opportunity of acquiring a genuine CONCERN, returning not less than £1200 to £1500 per annum, by purchase or as Partner or Manager with view to succession. Highest references, and best class town, suburban, and country experience. Address, PHARMACIST, care of Messrs. Sanger, 489, Oxford St., W.

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5. LONDON, S.W.—Retail, Prescribing and Dispensing BUSINESS in an important marketing thoroughfare. Established about 4 years. Returns £600, at good profits. Large shop, well stocked and nicely fitted. Every investigation courted. Business increasing. Price about £500.
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WALES, S. „ £700 „ £400.
WALES, S. „ £500 „ £250.
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PRESTON.—Returns £700, valuation, about £500.
PRESTON. „ £350 „ £300.
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SALOP.—Returns (good class country) £700, valuation, £500.
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NORFOLK.—Returns £1100, price £900.
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DERBY.—Returns £600, price to be arranged.
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Transfers, Valuations and Auctions conducted throughout the United Kingdom by Mr. BRETT, Leicester.

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AT Beckenham.—HOUSE with SHOP communicating. In good position, where Chemist is badly wanted. Rent £60 per annum. First half-quarter free. Outside repairs done by owner. Present occupant removing to larger premises. For particulars apply to E. WALLACE, 12, Limes Rd., Beckenham.

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THE Fixtures, with Bottles, Jars, &c., of a Druggist's shop, 14 × 6 by 12 × 9. Apply to PINCH & Co., Bath. An ASSISTANT wanted to take partial management of the above.

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MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

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6. STAFFS.—Mixed Country BUSINESS. Returns £550, with large profits. Good house, well situated. Rent low. Price about £300.
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NEW GOODS.

Special Notice to the Trade.

We beg to notify that the Proprietors of Lundborg's Perfumes have appointed us their Sole European Agents.

The LUNDBORG'S PERFUMES have gained such popular favour in other countries, that we anticipate for them an equal appreciation in the United Kingdom by people of refinement and good taste.

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As novelties in this market, the trade will, we believe, be glad to introduce them, as they yield a good profit and do credit to the introducer.

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Specially adapted for Coarse and Fibrous Drugs.

The principle upon which this Press operates is, that the drug is acted upon in a continuous thin layer which is forced forward by each revolution of the screw into smaller and smaller space, the leverage yielding a force so powerful as to extract almost the entire moisture, delivering the residue of suitable drugs with almost crisp dryness, and, as experience has shown, it saves a greater amount of Tincture (very important in the case of Tincture of Opium and other expensive drugs) than even the most powerful Hydraulic Press. So thorough is its action in this

respect that the *Chemists' Journal* has humourously remarked of it that "it will almost squeeze blood out of a turnip." One firm informs us that they have saved at least £20 more in three months, by the use of this Press, than they could secure by using any other. The working of this Press being continuous, either small or very large quantities may be operated upon at one time, and much more rapidly than in any other form of apparatus.

The fact that drugs require handling but once, that the use of press cloths is done away with, and that the operation is continuous, shows a great advantage in this Press over any other.

Price 15 shillings, subject to the usual Discount. Obtainable from every Wholesale Druggist.

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All of the Articles mentioned above may be obtained from any respectable wholesale firm, or from BURROUGHS, WELLCOME & CO., of SNOW HILL BUILDINGS, LONDON, E.C., the Sole European Depôt.

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The
Pharmaceutical Journal
AND
Transactions.

THIRD SERIES, No. 722.] SATURDAY, APRIL 26, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

SPECIAL NOTICE.

Next Wednesday, April 30th, is the last day on which the Secretary can receive Subscriptions.

EXTRACT FROM THE BYE-LAWS.

SECTION 1, CLAUSE 10—"All Subscriptions for the Current Year shall become due upon election, and *all Annual Subscriptions shall become due on the first day of January in every year*; and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the first day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society, certified by the Council at the Annual Meeting."

SECTION 17, CLAUSE 3.—"Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the Certificate or Diploma of Membership, if any, held by him. *No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the Certificate or Diploma of Membership, if any, shall have been returned.*"

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Subscription payable by Members and Associates in Business £1 1 0

Subscription payable by Associates and Apprentices or Students 0 10 6

Cheques and Post Office Orders should be made payable to the Secretary, and crossed "London and West-Bank."

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-third Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 21st day of May, 1884, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

THE JACOB BELL MEMORIAL SCHOLARSHIPS.*

TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the Lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships take place on the second Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

THE THIRTEENTH ANNUAL DINNER

OF THE

Members of the Pharmaceutical Society

AND THEIR FRIENDS

WILL TAKE PLACE AT THE HOLBORN RESTAURANT,

On TUESDAY, MAY 20th, 1884, at Half-past Six o'clock.

THE PRESIDENT IN THE CHAIR.

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WALTER HILLS.
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Honorary Secretary, RICHARD BREMRIDGE.

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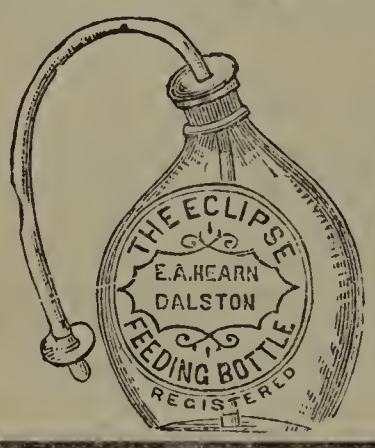

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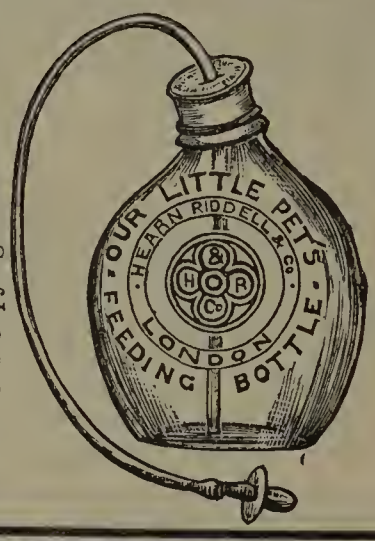

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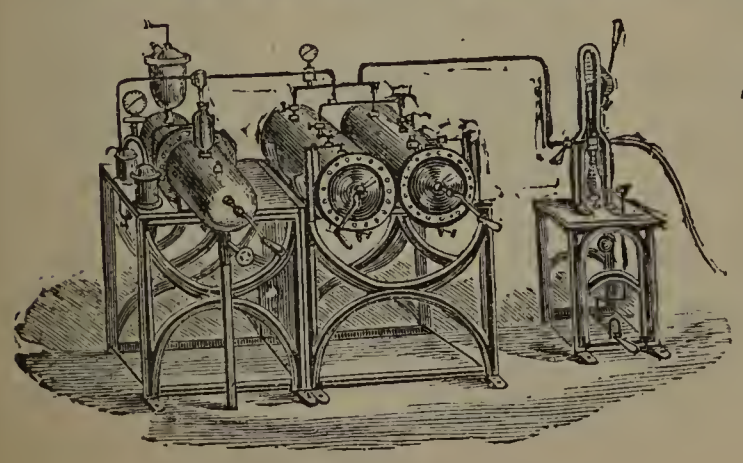

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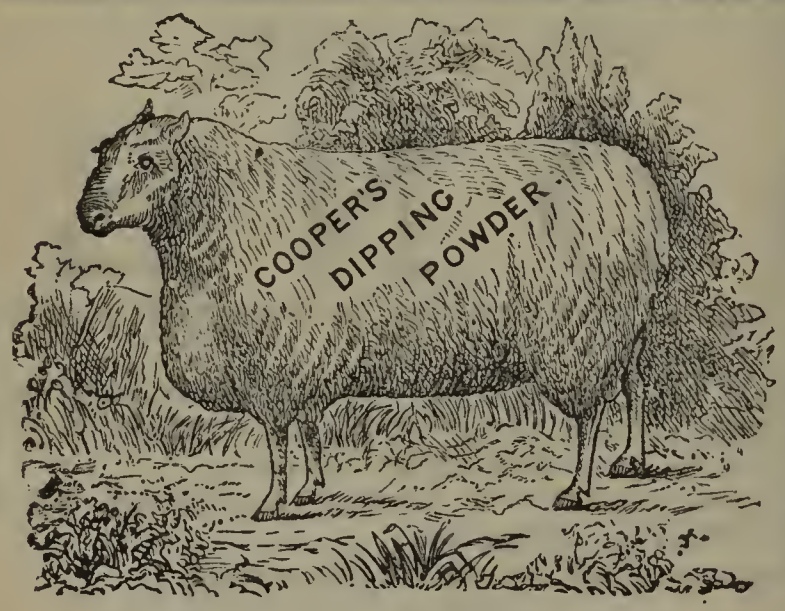

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"THE MONTH."

Considering the comparative immunity that has been hitherto enjoyed in these islands from earthquake shocks and the consequent absence of any provision for obtaining accurate and systematic seismological records, it is not surprising that the reports of the phenomenon which has caused so much alarm in the eastern counties during the last week should be characterized by extreme vagueness as to its occurrence and duration. Still, it may be expected that further light will be thrown upon these points, and, in fact, an interesting contribution in this direction has been already contributed to the *Leeds Mercury* by Messrs. Reynolds and Branson. Those gentlemen state that upon examining the diagram traced by their recording barometer on Tuesday they found that between 9.15 and 9.30 a.m. the ink-line thickened suddenly, whilst a gentle movement downwards was shown. A thickened line continued to be produced until 1.30 p.m., when the tracing regained its ordinary character. During this period of four hours six distinct undulations were registered, the greatest of which measured 0·025 in.

An ingenious modification of the process of bleaching has been introduced by Mr. J. B. Thompson, which promises to effect a great saving of time and labour. In the ordinary process the goods to be bleached are usually first boiled with lime for about seven hours, after which they are washed in water and "soured" by steeping them for four or five hours in water acidulated with hydrochloric acid. Then after another washing they are boiled for nine hours in soda ley, again washed, and next submitted to the "chemicking" process, which consists in steeping them in a dilute solution of chloride of lime for four hours. With the exception of the lime boiling this treatment is repeated several times, involving in the case of cotton goods some sixteen distinct operations, extending over a period of five to eight days. In Mr. Thompson's process the "souring" and "chemicking" operations are combined in one. The goods are placed in an air-tight "kier," connected on the one hand with a vessel containing a dilute solution of chloride of lime, and on the other with a gas-holder containing carbonic acid gas. A charge of the bleaching solution is first pumped in and the goods are allowed to soak in it during five minutes, after which communication is opened with the gas-holder and the liquor is run out from the bottom of the "kier." The partial vacuum thus created causes an inrush of the gas, and the goods are subjected to its action for fifty-five minutes, by the end of which time the whole of the chloride has been decomposed in contact with the fibre of the cloth. Bleaching liquor is then again pumped into the "kier," driving the gas back into the gas-holder, and these processes are repeated alternately according to the necessity of the case. Lastly, the goods are passed through a solution of triethylrosaniline and oxalic acid, which removes the natural faint yellow tinge from the cotton.

The interesting results obtained by Grimaux and Gerichte, establishing the close relationship existing between morphine and codeine, have induced Mr. W. C. Howard to take up the examination of thebaine, another opium alkaloid in which nitrogen and oxygen are present in the same proportions as in those two, the empirical formulæ by which the three are represented being—morphine $C_{17}H_{19}NO_3$, codeine, $C_{18}H_{21}NO_3$, and thebaine, $C_{19}H_{21}NO_3$ (*Berichte*, xvii., 527). Attempts made to add hydrogen atoms to the thebaine molecule so as to raise it to a homologue of morphine were unsuccessful. It was observed, however, that when thebaine was heated in a closed tube to about 90° C. with fuming hydrochloric acid, there occurred after a short time an abundant separation of crystals, whilst upon opening the tube there was an escape of a combustible gas. These crystals proved to consist of the salt of a new base, represented by the formula $C_{17}H_{17}NO_3$, and called "morphothebaine" to indicate that it is a decomposition product of thebaine as well as its probable near relationship to morphine. Whether in the decomposition that occurs one equivalent of HCl is taken up and one equivalent of C_2H_5Cl evolved, or two equivalents of HCl are taken up and two equivalents of CH_3Cl evolved, has not yet been determined, though from the fact that an ethoxyl group has not yet been observed in organic bases the latter is thought most probable. On the other hand, only a monoacetyl compound was obtained, though this may be attributable to one of two hydroxyl groups being more readily acetylized than the other, as has been observed in the case of morphine (see before, p. 603.) An analogous compound was obtained when hydrobromic acid was substituted for hydrochloric acid. It may be remembered that Grimaux looks upon thebaine as morphine-ethyl-ether ($C_{17}H_{18}NO_2 \cdot OC_2H_3$), though it has not yet been derived from morphine in this way.

Following up the investigations of Drs. Frazer and Brown in this country and many observers abroad, upon the relation between chemical constitution and physiological action in organic compounds, Dr. Stolnikow, of St. Petersburg, has been experimenting to ascertain the importance of the hydroxyl group in certain poisons (*Zeits. f. phys. Chemie*, viii., 252). It has been shown by Grimaux, and confirmed by Hesse and others, that morphine resembles a phenol in constitution, and that it contains a hydroxyl group, the hydrogen of which is replaceable by the methyl group (CH_3) to form codeine, which may therefore be considered the methyl ether of morphine. With this change, however, the physiological properties of the compound are modified, the narcotic action giving place to a tetanic action. Further, if, instead of the methyl group, the ethyl group (C_2H_5) is introduced, forming a new body that has been named codethyline, the tetanic action becomes more pronounced. Dr. Stolnikow's experiments were directed to ascertaining the effect when instead of an active alcoholic group an indifferent group is substituted, using what he calls a "morphine sulphuric acid ether," which is morphia minus a hydroxyl group and plus a residue of sulphuric acid:—

Morphine. . . . . $= C_{17}H_{18}NO_2(HO)$.
Morphine sulphuric acid ether $= C_{17}H_{18}NO_2(SO_4H)$.

Comparative experiments were also made with phenol, pyrogallol and resorcin, and with derivatives of those bodies in which a similar substitution had been effected. The general conclusions arrived at are that the toxicity of the original bodies is intimately bound up with the hydroxyl groups they contain; and when these are replaced by the indifferent sulphuric acid group, poisons are obtained which are far weaker, but which, as in the case of morphine and morphine sulphuric acid ether, are not at all altered in their nature.

The marked success that has attended the use of the oleates has induced Dr. Shoemaker to experiment with fresh compounds, and he reports (*Med. Bulletin*, vi., 38) that he has obtained valuable results from the use of the oleates of nickel and tin. The nickel oleate is prepared by the double decomposition of nickel sulphate and sodium oleate. It is described as a green, amorphous, waxy, tasteless substance, having a most decided astringent action, almost bordering upon the effect of a caustic. In cases of chronic eczema of the extremities, where the skin was hard and leathery, it is said to have given good results, and it is now being tested upon old ulcers and cancerous affections of the skin. An ointment is used of the strength of 15 grains of the oleate to 1 ounce of lard. The tin oleate, as prepared by the double decomposition of tin chloride and sodium chloride, is greyish yellow, of an unguent consistence and has a marked metallic taste. It has been found of great utility in giving lustre to diseased nails that have been abnormal or deficient in growth, and to assist by its local action in overcoming split and soft conditions of nails that often follow certain skin affections and external injuries. Combined with a little carmine, it is said to form an elegant toilet article, imparting a beautiful polish to the nails, and by its astringent action modifying the ragged and attenuated state of the skin at their base which gives rise to the troublesome affection of "agnails."

Dr. Lewis states (*Med. Bulletin*, vi., 46) that the odour of iodoform is "almost destroyed" by an admixture of an equal quantity of oleate of zinc. As the application of preparations of zinc has been suggested in many cases in which iodoform is used it is thought that this combination may be advantageous, especially where iodoform is found too irritating to apply alone.

Aluminium and its compounds are affirmed by Dr. Pick (*Med. Bulletin*, vi., 62) to constitute a most effective remedy against pulmonary tuberclosis, this opinion being based on experiments upon rabbits, as well as observations in clinical cases. In one of the latter, where infiltration of the apices of the lungs had occurred, removal of the lesion and all morbid symptoms is said to have followed the administration of aluminium in the following form:— Metallic aluminium, 8 grams; aluminium hydrate, 5 grams; calcium carbonate, 5 grams; gum tragacanth, q. s. Divided into sixty pills, one pill being taken three times a day.

The disagreeable taste and persistence of the odour in the breath which appear to be serious inconveniences attending the adminstration of paraldehyd, are calling forth the ingenuity of German dispensers. Herr Sutter (*Pharm. Zeit.*, April 9) says that he finds rum to be the most advantageous corrigent for masking the taste, and he gives the following formula which he says yields a mixture resembling cold punch :—

℞ Paraldehyd, 100
Jamaica Rum, 150–200
Tinct. Cort. Citri vel Aurantii Rec., 10
Syr. Simp., 300
Aquæ, 1390–1440.

Dose 100 grams. For the adminstration of paraldehyd as a clyster, he recommends a mixture in the proportion of one part of paraldehyd to two parts of olive oil. Herr Hellwig speaks favourably of two mixtures, (*a*) paraldehyd, 3; ol. oliv. 15; ol. menth. pip. gtt, 3; and (*b*) paraldehyd, 3; spiritus, 6; syr. simp., 8; and tinct. vanill., 2. But he prefers an emulsion of paraldehyd, 3; mucil. gum. acac. and syr. cort. aurant. āā 8, with the addition of two or three drops of ol. menth. pip.

M. Pierre Vigier has called attention to a subject which is worthy of being followed out both by prescribers and pharmacists. He points out that certain tinctures when mixed together in a prescription are likely to give rise to precipitates which may affect to a considerable extent the strength of the mixture. Thus a resinous tincture made with 80 or 90 per cent. alcohol will have its resinous matter precipitated by alcohol of 60 per cent. In other cases some of the constituents of a weak tincture may be thrown down by a stronger one. In rarer cases, as in that of tincture of calumba and tincture of cinchona, where tinctures of equal strength are mixed, a precipitate will be formed (*Practitioner*, p. 294). This will probably be especially the case where tinctures containing tannin are prescribed with other liquids containing an alkaloid such as ipecacuanha wine.

A new use for salicylic acid is coming to the front, Dr. J. C. Ogilvie Will (*Brit. Med. Journ.*, March 29, p. 602) describes a case of thickened epidermis of the foot, in which the whole anterior of the foot had become in two months like hippopotamus hide, but was completely cured in three weeks by the use of salicylic acid plaster. The advantages of salicylic acid in curing corns are well known. Dr. Will thinks that there is a very wide field of usefulness for this agent in some morbid conditions of the skin, the treatment of which has hitherto proved extremely difficult.

In the *Brit. Med. Journ.* (p. 605), a case of opium poisoning, in which other remedies had failed, was cured by the subcutaneous injection of $\frac{1}{60}$ grain doses of sulphate of atropine. The patient had taken a quantity of laudanum and paregoric, together, equal to 17 grams of opium.

Hydrochlorate of cocaine has been tried with apparent success by Aschenbrandt in the treatment of exhaustion arising from sunstroke, loss of blood and diarrhœa. In all the cases, particularly in those of the last-mentioned disease, the results obtained were such as to render further trials of this alkaloid desirable. The dose used was from 5 to 20 drops of a 1 per cent. solution (*Therapeutic Gazette*, p. 111, from *Deutsche medicinische Wochenschr.*).

The use of bichloride of mercury as an antiseptic appears to be increasing in favour. Dr. R. Caeestatt, of Uruguay, in the *Münchener Intell. Blatt* (March, 1884) recommends the topical application of a solution of 1 part in 10,000 in the treatment of diphtheria, the part affected being painted every hour with the sublimate solution, using a fresh feather or brush each time. At the same time he gives chloral in larger or smaller doses and disinfects the patient's room by sprinkling the floor with a $2\frac{1}{2}$ per cent. solution of carbolic acid (*Med. Press*, April 9, p. 340). It may be useful to point out that in the abstract from which this quotation is made 1 part in 10,000 is incorrectly stated to be about a gram to the pint.

Dr. Quinlan (*Brit. Med. Journ.*, April 5, p. 664) now recommends the mullein (*Verbascum Thapsus*) to be smoked as a remedy for cough. In a case which he has recently recorded considerable relief was afforded by its use in this way. A sample of the plant was lately found to contain belladonna leaves, as well as other leaves which were not those of *Verbascum Thapsus*. It is desirable, therefore, before the entire

credit is given to mullein that careful experiments should be made with selected leaves of that plant.

Dr. Chèvon, in *Le Progrès Médical* (Feb. 23), has recommended veratria as a prompt remedy for pruritus, whether arising from prurigo, urticaria, eczema, herpes, or without any eruption at all. For this purpose he uses an ointment of 1 part of veratria to 120 of lard, but when the pruritus is general he prefers the internal administration of the alkaloid, and gives it in the form of pills. Two centigrams of the alkaloid are made into ten pills with liquorice powder, the dose being one pill three times a day, an additional one being given each successive day until a maximum dose of six is reached (*Med. Times*, April 12, p. 509).

Dr. Hicks, writing in the *New York Medical Journal*, expresses his surprise that coca is so seldom employed, and states that he has found it useful in backache, with high-coloured urine, and excess of uric acid and urates; in short breathing from weakness of the muscles of respiration; in palpitation due to dilatation or weakness of the muscles of the heart; in the craving for alcohol, which it destroys; in headache resulting from over-exertion; and in sick-headache, when given in small doses.

Dr. Bury Hart, led by the statement of Dr. Matthews Duncan that the vomiting of pregnancy is probably influenced by the liver, has tried the effect of iridin, which he states in eight cases out of nine has proved effectual. The dose given has been 2 grains, taken at night and followed by a saline aperient in the morning (*Med. Times*, April 19, p. 539).

At a very influential meeting at the Parkes Museum on March 27 last, at which Dr. Watson Cheyne gave a demonstration of pathogenic micro-organisms, the Chairman, Sir Joseph Lister, remarked that the interesting fact that the bacillus of septicæmia of the house mouse was not capable of causing the disease in the field mouse, led him to conceive that if the slight difference in the blood of these two animals was sufficient to alter the conditions favourable to the development of the bacteria, it was possible by the administration of some medicines that sufficient alteration might be produced in the blood of the human system to kill off or prevent the development of any special bacteria on the first appearance of the symptoms of the disease in the patient.

An examination of the bacteria found in the human intestines has been made by T. Bienstock. He found that in healthy men these belonged exclusively to the group *Bacillus*, their spores alone having sufficient power of resistance to the antiseptic action of the gastric fluid. Of this group five distinct forms were observed, but of these only two manifested any remarkable chemical or physiological properties. These two are invariably present in the digestive canal below the stomach in individuals beyond the age of suckling. The one form causes the decomposition of albumen: this was absent in the intestines of infants fed only on milk. The other has only the power of splitting up carbohydrates, from which it forms alcohol and lactic acid. After cultivation for from twenty to sixty generations these bacilli still retain their power. (*Journ. Microsc. Soc.*, p. 267).

According to some experiments made by G. Bufalini (*Brit. Med. Journ.*, March 29, p. 626) the poison of viperine differs from that of the colubrine snake in resembling the action of an alkaloid, inasmuch as the blood of animals poisoned with viperine poison is not capable of causing death when injected into another animal, whereas that of animals poisoned by the colubrine snake can do so. The difficulty of finding a general antidote for snake bite is thus increased, since it is obvious that what may be an antidote in one case is not likely to be so in another.

In an article in the *American Journal of Pharmacy* (p. 188), translated from the *Pharmaceutische Rundschau*, on "Pipitzahoic Acid," Dr. Charles Mohr gives two figures of species of *Perezia*, whose roots yield this beautiful substance, and states that *Perezia Wrightii*, Gr., yields larger quantities of the acid than *P. nana*, Gr.

Some investigations made by Kugler on the suberin of the *Quercus Suber* indicate that it has a relationship with the fatty oils. He regards it as a fatty oil, composed chiefly of stearine and the glycerine compound of a new acid, phellonic acid, $C_{20}H_{42}O_3$, which has a melting point of 96° C. This throws some light on the formation of Japanese wax in the epidermis of the fruits of *Rhus succedanea*, and of Carnauba wax on the leaves of *Corypha cerifera*, which appear to result from the suberization of the cell walls.

In the *Journal of Botany* (April, p. 124) Mr. Greenwood Price points out that crystals of the colouring material present in the petals and other parts of plants are not, as a rule, easy to obtain, but that they can be easily seen in the well-known stove plant *Justicia speciosa*. If a fragment of a stamen of this flower be mounted in dilute glycerine jelly, not too hot, the colouring matter collects in a few hours in the form of minute, slender prisms, forming a very interesting microscopical object under a quarter-inch objective.

From some researches made by H. Pick it would appear that the red colouring matter of the young shoots and leaves of trees and perennial plants, such as the oak, rose, willow, and cinnamon, is always connected with the presence of tannin, at the expense of which it is formed under the influence of the direct action of sunlight and a low temperature. By the experiment of growing plants behind a screen of the solution of this red colouring matter it was ascertained that the red light is especially favourable to the absorption and transport of starch. The bright red colour of the fruit of *Rivina humilis*, and the bracts of *Euphorbia fulgens*, is, however, according to T. Hildebrand, produced by the superposition of cells containing different pigments of orange and violet-red, and the colouring matter of the bright red root of *Wachendorffia thyrsiflora* is due to a coloured fluid substance in the cells, which is formed even in absolute darkness.

The gourd, *Cucurbita Pepo*, contains large sieve-tubes, from which, when wounded, a juice flows out in large quantities, of an alkaline reaction, which can easily be separated from the ordinary cell-sap. The composition of this juice has been investigated by E. Zacharias by ordinary chemical tests. He finds three classes of substances in the juice:—albuminoids, non-albuminous organic substances, and inorganic salts. If the juice from the sieve-tubes is allowed to stand for a short time, the albuminoids readily separate from it in the form of a transparent colourless rather stiff jelly. Chemical tests show that this substance is of the nature of fibrine, mixed with a small quantity of a substance insoluble in the

gastric juice and in dilute potash ley. When this has been removed by strong alcohol, a substance is left in the filtrate which turns the plane of polarization to the right. This substance is of the nature of dextrin, and is converted by dilute sulphuric acid into glucose. The presence of a nitrate or nitrite can also be recognized both in the aqueous solution and in the ash. Zacharias was unable altogether to decide the question of the presence or absence of amido-acids and of other organic nitrogenous compounds soluble in water. Of inorganic salts there was found in the ash distinct evidence of the presence of magnesia. Experiments also indicated the probable presence in the sieve-tubes of potassium phosphate, to which may be attributed the alkaline reaction of the juice.

In *Nature* (April 10, p. 552), Mr. Marshall Ward gives an interesting extract from the *Arbeiten des botanisches Institut*, of Wurtemberg, of work done by Professor Sachs during last year, relating to the formation and disappearance of starch in plants in the open air. It appears from Sachs' observations that the starch formed in the leaves during the day may disappear completely during the night, and that the leaves shown to be full of starch in the evening may be quite free from it the next morning. This he proved by cutting a leaf longitudinally in half on a fine sunny day, placing the one half in boiling water for about ten minutes, then in alcohol to remove chlorophyll, etc., and then laying the decolorized leaf in an alcoholic solution of iodine, the other half of the leaf being similarly tested the next morning before sunrise. He has also confirmed the statement that the transformation of the starch into glucose and the transference of the latter by way of vascular bundles into the stems also goes on during daylight, but is less evident because more starch is formed than is abstracted. This fact had already been demonstrated by Moll, by exposing leaves to the sunlight in an atmosphere freed from carbonic acid by potassic hydrate. The average amount of starch produced per square metre is estimated by Sachs to be 20 to 25 grams per day, and the average rate of production at 1·648 grams per hour. Mr. Ward points out that several practical results follow from these experiments. Leaves used as fodder, hay, etc., will vary very much in nutritive value, according to the warmth and brightness, etc., of the weather, and the time of day when it is cut, and the same remark applies to the collection of tobacco, tea, etc., the former of which, in some countries, is habitually cropped in the morning. It may be added also that the knowledge thus arrived at may be turned to account in the collection of medicinal plants for the preparation of extracts.

At the meeting of the Linnean Society on April 3, Mr. W. Brockbank exhibited a series of double daffodils, some of which showed that the double character of the flower was not due to the alteration of the stamen nor to the multiplication of the floral envelopes at the expense of the ovules, inasmuch as in some specimens of double flowers stamens were present, and in others the ovary was full of ovules. He believed that the double flowering plants were propagated by seed.

Some interesting experiments have been carried out by F. Heyer (*Journ. Microsc. Soc.*, p. 251) with a view to determine the cause of differentiation of sex in unisexual plants. The results obtained in the case of dicœcious plants, by experiments with twenty-one thousand specimens of *Mercurialis annua* and six thousand of *Cannabis indica*, was that external conditions have no influence on the production of seedlings of one or the other sex. In the case of the former plant the proportion of males to females produced was as 105·85 to 100, and in the latter as 86 to 100. In a second series of experiments made with monœcious plants to determine whether external conditions of temperature and soil caused any difference in the proportion of male and female flowers, *Urtica urens*, *Atriplex Spinacia*, *Xanthium*, and various *Cucurbitaceæ* produced negative results. He also came to the conclusion that sex is determined at an earlier period than the ripening of the seed. A knowledge of the means whereby female plants could be produced at will would be of considerable commercial importance, as, for instance, in the cultivation of nutmegs.

J. Constantin finds as the results of extended investigations that the duration of a plant and the presence of a rhizome or other underground stem are, to a certain extent, dependent on external circumstances. Thus the proportion of perennial plants increases with the altitude above the sea level, and the same species is sometimes annual at low altitudes and perennial at high elevations. The tissues of the stem become modified by being buried in the soil. The angles of the aerial stem when present tend to disappear, a suberous layer or a suberized epidermis being much developed; the means of support, such as collenchyma, liber fibres, etc., tend to disappear, and food materials are largely increased (*Journ. Microsc. Soc.*, p. 253).

At a recent meeting of the Linnean Society the Rev. J. M. Crombie read a paper controverting the Schwendenerian theory of the composite algal-fungal nature of lichens. In support of his position he pointed out that the hyphæ of lichens differ from those of fungi in being straighter, much more permanent in character than those of fungi, in containing lichenin, and in not being destroyed by solution of potash. He showed also that in cases where the hyphæ of fungi penetrate lichens on trees or rocks they invariably destroy the gonidia, instead of stimulating their growth, and that the same takes place when algæ on the bark of trees are attacked by fungal mycelium. Some very pretty specimens of lichens in an early stage of growth on bare flints and pebbles were exhibited, showing the hypothallus with the lichen thallus just forming under circumstances in which algæ would not flourish.

Some important facts have been ascertained concerning the development of bark, which may probably throw some light upon the best mode of cultivating cinchona trees for the bark. A. Gehmacher finds that the growth of bark is influenced greatly by pressure, that the less the pressure the more numerous the cork cells become, and the greater the pressure the more they diminish. The bast fibres also increase considerably in number with diminution of pressure; when the pressure is very great very few bast fibres or none at all are formed. The bast fibres also increase in size with diminished pressure.

Apropos of what has been remarked concerning the value of cinchona barks, Dr. de Vrij writes that at Amsterdam on February 29 last he observed that two lots of Ledgeriana bark containing 4·05 per cent. of pure quinine were sold at 3*s.* 7*d.* per half kilogramme, whilst one lot of red bark containing 7·35 per cent. of total alkaloids and only 1·18 per cent. of pure

quinine was sold at 3*s.* 5*d.* per half kilogramme. The latter was, however, in long quills having a fine appearance. It is obvious, therefore, that price alone is no indication of alkaloidal contents. He also remarks that the presence of cinchonidine in many samples of commercial quinine is easily detected by the optical test recommended a few years ago by Professor A. C. Oudemans.

When balsam of peru arrives at Acajutla and La Libertad, the ports on the "balsam coast" from which it is chiefly shipped, it is in a crude state, usually of a grey-green to a dirty yellow colour, and requires to be submitted to a process of purification before it is fit for exportation. Concerning this process a correspondent of Messrs. Gehe and Co. furnishes some interesting information. He states that a first clarification is effected by allowing the crude balsam to stand in a large iron vessel capable of holding six or seven hundred pounds during a week or a fortnight, by which time the heavier impurities sink to the bottom and the lighter ones float as a scum on the surface. The clear balsam, which has already attained its characteristic black-brown colour, is then drawn off through a tap fixed about four inches from the bottom of the vessel and run into a tinned iron boiler set over an open fire and boiled moderately for two or three hours. All scum is removed as it makes its appearance, and the boiling is continued as long as any continues to be formed. It can easily be understood that the physical properties of the balsam will differ according to the temperature to which it is submitted during this boiling, and it is alleged that the lower specific gravity observed in balsam of peru during recent years is attributable to a modification it undergoes in this operation, and is quite consistent with the genuineness of a given sample.

Besides the foregoing the new quarterly report of Messrs. Gehe has several interesting notes. It is mentioned that whilst a few years since the price of quinidine (conquinine) was double that of cinchonidine, cinchonidine has lately found so much favour in the United States that its price has now become relatively higher than that of quinidine. This tendency has been favoured by the large quantities of cuprea bark that have been worked during the last few years, since in it quinine is accompanied only by quinidine and by no cinchonidine. In Germany the consumption of codeine has become so large that orders have to be executed in the order in which they are received and a hope is expressed that its preparation synthetically upon the manufacturing scale may become possible. Further, the demand for the glucoside adonidin, which is said to resemble digitalin in its action on the heart without being cumulative, has been so extensive that all the native grown *Adonis vernalis* was bought up immediately after gathering, and it became necessary to look to Southern Russia for a further supply of the herb. A tincture from the flowers and leaves of *Convallaria majalis* also remains in request as a digitalis substitute, but digitalin, notwithstanding its competitors, still holds its place. Arbutin, the glycoside obtained from the leaves of *Arbutus uva-ursi* is being used for diseases of the kidneys and bladder. As anæsthetics the bromide and chloride of ethylene are stated to be again coming into favour for external use, and to these the iodide has recently been added. The two former are liquids, but the iodide is a white crystalline substance. Bromide of ethyl is also in active request for internal administration.

THE USE OF ROSOLIC ACID AS AN INDICATOR, WITH ADDITIONAL NOTES ON PHENOLPHTHALEIN AND METHYL ORANGE.*

BY ROBERT T. THOMSON.

The following notes are simply an addition to my former paper on the use of litmus, methyl orange, phenacetolin and phenolphthalein as indicators. The object in view, as I stated before, was to determine the value of each indicator when applied to the estimation of alkalies and free acids, and to ascertain the effect (if any) of the impurities, such as sulphites, sulphides, phosphates, etc., usually found in commercial hydrates and carbonates of the alkalies. The tests were carried out in precisely the same way as described in the former part of this paper.

(1) *Delicacy of Rosolic Acid in Absence of Interfering Agents.*—The solution employed contained 2 grams of rosolic acid per litre, 50 per cent. alcohol being the solvent used. To test the delicacy of this indicator ·5 c.c. of its solution was added to 100 c.c. of distilled water and decinormal hydrate of sodium (1 c.c. = ·0031 gram Na_2O) dropped in. To effect the complete transformation of the pale yellow to a deep pink colour only ·1 c.c. of the standard alkali was required. This is equal to ·01 c.c. of normal alkali, and this figure should be borne in mind for the sake of comparing the delicacy of the rosolic acid in absence of interfering agents with its delicacy in presence of the salts to be examined.

(2) *Application of Rosolic Acid to the Determination of Available Alkali in Pure Hydrate, Carbonate and Bicarbonate of Sodium and Potassium.*—It is hardly necessary to give a detailed account of this portion of the subject. Several tests were made with quantities of the hydrate and carbonate of sodium and potassium containing 1·55 grams of Na_2O and 2·355 grams of K_2O respectively, with the result that exactly these amounts were obtained in each case by titration with normal sulphuric acid. The deep pink colour retains its original intensity up to the point at which bicarbonate of sodium is produced, but soon gives place to pale yellow, owing to the action of the liberated carbonic acid. It is therefore necessary to boil the solution thoroughly after each addition of acid to bring back the pink colour, and when this is attended to the end-reaction is extremely delicate, and can be effected by at least one drop (about ·05 c.c.) of normal acid.

(3) *Determination of Free Ammonia.*—Several experiments made in each case with a solution containing ·85 gram of ammonia (NH_3) gave identical and accurate results. The pink colour remained undiminished in intensity until 49·8 c.c. of the normal acid had been consumed; but on further addition of acid drop by drop, the pink slowly acquired a yellow tinge, and when 50 c.c. had been added the former was wholly eliminated, leaving only the pale yellow colour; but although this is the case, the end-reaction is tolerably distinct. This decrease in delicacy of the rosolic acid is not due to carbonic acid, as the ammonia employed did not contain an appreciable quantity of carbonate; but, as I shall show presently, is owing to the action of the salt of ammonium formed. Rosolic acid has been specially recommended as an indicator for ammonia determinations, but it is evident that it has no peculiar value for that purpose, even the much-abused litmus being considerably superior to it.

(4) *Effect of Sulphate, Chloride, and Nitrate of Sodium, Potassium, and Ammonium.*—The quantities of these salts operated upon were equivalent to 1·55 gram of soda (Na_2O), 2·355 grams of potash (K_2O), and ·85 gram of ammonia (NH_3) respectively. The presence of these salts of sodium and potassium does not sensibly affect the delicacy of the rosolic acid, but each of the salts of

* Read before the Chemical Section of the Philosophical Society of Glasgow, March 19, 1883. Reprinted from the *Proceedings of the Philosophical Society of Glasgow.*

ammonium required ·2 c.c. of normal hydrate of sodium to develop fully the deep pink colour, as against ·01 c.c. when tested with distilled water alone.

(5) *Effect of Sulphite of Sodium.*—The remainder of the experiments were made only on sodium salts, as I did not think it necessary to examine further the potassium and ammonium salts. Two tests were made with 3·15 grams of normal sulphite of sodium, which contain 1·55 grams of soda (Na_2O). When titrated in the cold only ·2 c.c. of normal sulphuric acid was required in both cases to destroy the pink colour, but, when boiled, 5 and 5·2 c.c. were respectively necessary, the results being, in the cold ·006, and in the hot ·155 and ·161 gram of soda (Na_2O). On cooling the boiled solution and titrating back with normal soda, 4·8 c.c. were required to restore the pink colour. From these results it is evident that normal sulphite of sodium (Na_2SO_3) is practically neutral to rosolic acid in the cold, which it also is, as I showed before, to phenolphthalein, while to methyl orange, litmus, and phenacetolin the bisulphite ($NaHSO_3$) is the neutral salt. It is noteworthy that the two last-named indicators give, with the sulphite, very undecided end-reactions, while the three former give very sharp and well-defined end-reactions.

(6) *Effect of Thiosulphate of Sodium.*—This salt is perfectly neutral to rosolic acid.

(7) *Effect of Sulphide of Sodium.*—The whole of the sodium in this compound is accurately estimated by standard sulphuric acid, with rosolic acid as indicator. The pink colour retained its original intensity until the sodium hydrogen sulphide (NaHS) was formed, but on further addition of acid gave place to yellow, owing to the action of the liberated sulphuretted hydrogen. On boiling, the pink colour returned, and a very sharp end-reaction was secured. It is only necessary to state that the results agreed substantial y with those obtained with methyl orange and litmus.

(8) *Effect of Phosphate of Sodium.*—Two tests were made with 1·775 grams of monoacid orthophosphate of sodium, which contains ·775 gram of soda (Na_2O). In one case 12, and in the other 12·2 c.c. of normal acid were necessary to complete the change from deep pink to yellow. As the transformation in colour was gradual, the end-reaction was extremely unsatisfactory. The results, however, show that the monoacid sodium phosphate is strongly alkaline, and the diacid salt practically neutral to rosolic acid. It is noteworthy that rosolic acid agrees in this respect with litmus, methyl orange, and phenacetolin, but differs from phenolphthalein, which indicates the monoacid phosphate as the neutral salt; while normal sodium sulphite is neutral to both rosolic acid and phenolphthalein, but strongly alkaline to litmus, methyl orange, and phenacetolin.

(9) *Effect of Silicate of Sodium.*—With rosolic acid as indicator, the whole of the soda can be estimated by titration with standard sulphuric acid. This must be done in a boiling solution, as otherwise a good end-reaction is not obtainable. The tests were made side by side with experiments made on the same quantity of silicate of sodium and using methyl orange as indicator. The results were identical.

(10) *Effect of Alumina.*—The solution employed for each experiment contained ·775 gram of available soda, and ·103 gram of alumina. In one titration 25·2 c.c., and in the other 25·25 c.c. of normal sulphuric acid were consumed, which show ·781 and ·782 gram of soda respectively, instead of ·775. Rosolic acid thus behaves in much the same way, and gives high results to the same extent, as litmus.

(11) *Effect of Nitrite of Sodium.*—This salt is quite neutral to rosolic acid.

(12) *Determination of Soda in Borax.*—Rosolic acid is not well fitted for use in this titration, as the end-reaction is extremely indistinct. A solution containing 1·683 grams of biborate of sodium ($Na_2B_4O_7$), which is equal to ·516 gram of soda, was employed; but after the addition of 13·6 c.c. of normal sulphur acid, its pink began to assume a yellow tint, and the former colour was not discharged till 16·6 c.c. had been consumed. This latter result gives ·514 gram of soda as against ·516 actually present. I showed before that the best indicator for borax was methyl orange, which gives a well-defined end-reaction.

(13) *Determination of Free Sulphuric, Nitric, Hydrochloric, and Oxalic Acids.*—Rosolic acid is an excellent indicator for use in the determination of these free acids, either by standard hydrate of sodium or potassium, the end-reaction being extremely delicate.

(14) *Determination of Free Tartaric Acid.*—For this purpose rosolic acid is not so well fitted as phenolphthaline; but the end-reaction is tolerably distinct, and fairly accurate results are obtainable.

(15) *Determination of Free Acetic and Citric Acids.*—Rosolic acid is useless as an indicator in the determination of these acids, as, besides the end-reactions being very indefinite, normal acetate of sodium is slightly, and normal citrate of sodium considerably alkaline to this indicator. In this respect rosolic acid resembles litmus, while the delicacy of phenolphthalein, and the accuracy of the determinations made with it, are perfect.

It is plainly evident, on taking a survey of the above results, that rosolic acid has no particular superiority over other indicators, unless in some cases the fact of normal sulphite of sodium being neutral to it in cold solutions may be found useful. In nearly every case it behaves like litmus, and has none of the good qualities not possessed by the latter indicator, but which distinguish phenolphthalein, methyl orange and phenacetolin.

Having now concluded the consideration of rosolic acid, I will give a few supplementary notes on the use of phenolphthalein and methyl orange as indicators.

(1) *Determination of Free Citric and Acetic Acids.*—In the former portion of this paper phenolphthalein was recommended as being the only perfect indicator for this purpose, but it was not mentioned that the titration should be done in the cold. The reason for this is, that although the normal citrate and acetate of sodium are quite neutral to phenolphthalein in the cold, yet when heated they give a slightly alkaline reaction (this is especially the case with the citrate), so that a sensibly high result would be obtained in a hot solution Of course, in the case of acetic acid a hot solution dare not be used, unless excess of soda is first added, and titrated back with acid.

(2) *Phenolphthaleïn as an Indicator in the Determination of Free Ammonia.*—This is a very important point to which special attention should be directed, particularly with the view of correcting some misleading statements that have been published respecting this indicator. I pointed out formerly that phenolphthalein was incapable of showing at what point a solution containing a salt of ammonia was neutral, the reason being that such a salt had the effect of destroying the red colour produced by the ammonia, even when the latter was present in considerable proportion. Phenolphthalein has, however, been directly recommended as an indicator for ammonia by one author, and the monoacid phosphates of sodium, potassium and ammonium have been stated by another chemist to be neutral to it. This is true as regards the phosphates of sodium and potassium, but with the ammonium salt no definite neutral point is obtainable, owing to the decolorizing action of the salt itself. The experiments made by these chemists have evidently been confined to potassium and sodium salts, while the behaviour of the ammonium salts has been simply assumed from these results. These facts show how incorrect statements may be made by trusting solely to the analogy between the salts of the alkali metals and ammonium.

(3) *Valuation of Phosphate of Sodium or Potassium and Phosphoric Acid.*—In the former portion of this paper I

had occasion to describe the behaviour of normal orthophosphate of sodium and potassium when titrated with sulphuric acid, methyl orange and phenolphthalein being used respectively as indicators. The neutral point with methyl orange is reached when the diacid phosphate (NaH_2PO_4 or KH_2PO_4) is formed, while with phenolphthalein the neutral salt is the monoacid phosphate (Na_2HPO_4 or K_2HPO_4). On this definite difference of indication (which represents exactly one-third of the phosphoric acid present) I have ventured to base a process, which gives fairly accurate results, for the valuation of any of the orthophosphates of sodium or potassium, or of phosphoric acid. This is certainly a determination that is seldom required, but a rapid process of this description is at least of some interest, and may occasionally be found useful. The method consists in adding to 5 or 10 grams of the sample, previously dissolved in about 80 c.c. of water, normal sulphuric acid from a burette till the faintly acid reaction with methyl orange is obtained, or, in the case of phosphoric acid, normal caustic soda is added to the same point. The amount of acid or alkali added need not be measured, as the object is simply to add exactly enough to produce the diacid phosphate. The mixture is now boiled for a short time to expel carbonic acid, if present; then cooled (if the solution is kept hot a low result will be the consequence), a little phenolphthalein added, and the titration accomplished by normal caustic soda or potash, one c.c. of which will represent ·098 gram of phosphoric acid (H_3PO_4), or ·142 gram of monoacid sodium phosphate (Na_2HPO_4). Several tests were made of a sample of ordinary phosphate of soda, the results being controlled by two determinations by precipitation with magnesia mixture. The following were the results:—

By Alkalimetric Method.			By Precipitation as $Mg_2P_2O_7$.
Grams of Phosphate of Soda tested.	C.c. of normal NaHO consumed.	Percentage of Na_2HPO_4.	Percentage of Na_2HPO_4.
10	28·1	39·90	40·29
5	14·1	40·04	40·35
5	14·1	40·04	—

The theoretical percentage of dry phosphate of sodium in the crystallized compound is 39·66. It will be readily seen, from the nature of the process, that the presence of carbonate, sulphate, chloride, nitrate, thiosulphate or sulphide of sodium or potassium, will not influence the accuracy of the results. If sulphite of sodium is present, it must first be oxidized to sulphate by the addition of a little peroxide of hydrogen (excess of which does not affect the delicacy of the indicators), as otherwise a high result would be obtained.

It will be observed that I have not noticed the application of phenolphthalein as an indicator in the determination of caustic alkali in soaps, of free and combined fatty acids in oils and fats, and of resin acids—the reason being that this subject has been fully entered into by various chemists.

In conclusion, I may state that I am examining further the behaviour of phenolphthalein, methyl orange, phenacetolin, rosolic acid, litmus and other indicators, with other chemical compounds, having in view the special object of extending their employment, if possible, in the analysis of commercial chemical products.

NIGELLA SATIVA.*

BY HENRY G. GREENISH.

Under the title "Étude sur des Médicaments Nouveaux" M. Eugène Collin, a French pharmacist, has recently published information collated from various sources, concerning several "new remedies." Amongst them was one which attracted my special attention. It was *Nigella sativa*, and I decided to make it the subject of my report because I wished to point out certain corrections that should be made in M. Collin's description and at the same time communicate to you the results of some experiments I have been making during the past few months.

As M. Collin's article is not very lengthy I will reproduce it here (translated from the French), omitting the microscopical description and a few unimportant details.

"This plant" (*N. sativa*) "is a native of the island of Crete. It is cultivated in Egypt, Persia and India. The seeds are very commonly employed under the name of 'abesodé' or 'habe sodé' that is 'black grains.' They are also sometimes termed 'black cummin.'

"The seeds of *N. sativa* are very small, measuring 1½ mm. in length, and ½ mm. in their greatest breadth; they are of a dead black colour, perceptibly quadrangular, flattened longitudinally, with prominent edges. Examined with a lens the surface is seen to be finely pitted. A somewhat aromatic odour is developed when the seed is crushed, recalling the peculiar smell of umbelliferous plants.

"The seeds have been used from the earliest ages, as they are mentioned in the Bible. The Egyptians sprinkle the powdered seed on bread and cakes as a stimulant to digestion. In Hanover they are mixed with stews under the name of allspice. The inhabitants of India have used them from time immemorial as an emmenagogue. In the last century black cummin seeds have been used to stimulate the lacteal, urinary and intestinal secretions; they have also been employed as a remedy for the bites of poisonous animals, etc.

"M. Canolle has recently published the results of clinical investigations undertaken in the hospital of Karikol with black cummin seed. He has observed that after doses of 10–40 grams of the powdered seed the temperature of the body is raised, the pulse accelerated and all the secretions stimulated, especially those of the kidneys and skin; in doses of 10–20 grams they possess a well-marked emmenagogue action in dysmenorrhœa.

"Pellacani has found two alkaloids in black cummin seed which he has isolated and named respectively nigelline and connigelline.

"Nigelline resembles curarine in the physiological effects it produces on frogs and mammals, whilst connigelline more nearly approaches jaborine and atropine."

From whatever source the foregoing description of the seed is taken, it refers, without doubt, to *N. sativa*, as a comparison with a genuine sample will at once show. The three or four-sided seeds with prominent angles, flattened surfaces and peculiar odour when crushed are characteristic of *N. sativa*. The taste is something more than feebly aromatic, it is decidedly acrid.

The seeds of *N. damascena*, which are frequently substituted for *N. sativa*, develop an equally characteristic but perfectly distinct odour when crushed; their rounded shape, the deep transverse furrows, and the taste distinguish them from *N. sativa*.

That the samples of these two seeds now before you are genuine I have proved by cultivating the plants and comparing them when in flower with the descriptions and with specimens in the Kew Museum.

It is remarkable that although the two species differ so considerably, the chemical investigations carried out by Reinsch, Flückiger and Pellacani were (as I pointed out some time since in the *Pharmaceutical Journal*) made with *N. damascena*, not with *N. sativa* as published. M. Collin appends to an accurate description of *N. sativa* taken from one source, an account of the chemical constituents of *N. damascena* from another, an error which might easily have been avoided by a glance into the pharmaceutical literature of the past year or two.

The question will now naturally be asked, What seed has Dr. Canolle employed in his physiological experiments?

* Report on Pharmacology, read before the School of Pharmacy Students' Association.

This I attempted to answer by a reference to Dr. Canolle's paper in the *Journal de Médecine*, of Paris. Unfortunately, I have not been able to obtain access to this journal. I have, however, consulted the works on Indian botany and Indian materia medica in our library, and found that *N. sativa* was largely cultivated there, the seed being used as a condiment and in medicine; of *N. damascena* there is no mention whatever.

To ascertain now whether the seeds described as being derived from *N. sativa* were really the seed of that plant, I repaired to the Kew Museum. Through the kindness of the Curator, Mr. Jackson, I obtained samples of specimens from Egypt, Aden, Burmah, Bombay and Madras (Karikol, where Dr. Canolle's experiments were made, being in the latter Presidency); they proved to be all true *N. sativa*, possessing the characteristic shape, odour and taste.

There can, therefore, be little doubt that the seeds administered by Dr. Canolle were those of the true *N. sativa*.

In the seed of *N. damascena* (or at least a mixture with *sativa*), Dr. Pellacani found two alkaloids, nigelline and connigelline; of the latter 35 lbs. of seed did not yield as much as half a grain; nigelline was found in larger quantity, but how much larger we are not informed. Fifteen centigrams of nigelline produced in a rabbit a flow of saliva and a discharge from the eyes which lasted about forty-five minutes, after which the animal was perfectly recovered; in its action this alkaloid resembles pilocarpine.

According to Pellacani the presence of these two alkaloids, nigelline and connigelline, satisfactorily explains the physiological effect observed by Canolle, but from what I have said it must be clear that, although these alkaloids may possibly produce effects similar to those observed by Canolle, yet of the origin of the therapeutic activity of *N. sativa* there is at present not a scrap of positive evidence.

Some years ago I examined the seed of *N. sativa*, and was fortunate in procuring a genuine sample. Details of this examination have already been published in the *Pharmaceutical Journal*, and as far as I know it is the only investigation that has ever been made of the true *N. sativa*. Although I was unsuccessful in attempting to isolate an alkaloid, I found a glucosidal principle allied to saponin, to which the name melanthin was given. This substance I have recently obtained in larger quantity and pure white in colour. *N. damascena* contains at most only traces of it.

This melanthin has never been tested physiologically, and I am afraid that at present there is but little prospect of such experiments being made, unless indeed I carry them out myself upon my own person. Saponin, however, to which melanthin is nearly related, has produced effects similar to those observed by Canolle, viz., an increase in the secretions, and even vomiting and diarrhœa; and senega, which contains a considerable amount of saponin, has been found serviceable in amenorrhœa. Until proof is adduced to the contrary it is quite within the bounds of reason to suppose that to the melanthin contained in the *N. sativa* part at least of the therapeutic activity may be due.

Being desirous of ascertaining the distribution of melanthin in the plant producing it, I had some of the genuine seed grown for me and the plants gathered at different stages of development. For the care with which this was carried out I have to thank my friend Mr. Gadd, now pharmaceutical chemist in Ramsgate, formerly a member of this Association. At the same time I had the seed of *N. damascena* grown in a similar manner.

I had eventually at my disposal plants of both species gathered—

(1) in a very young state;
(2) shortly before flowering;
(3) whilst in full flower, with unripe seed;
(4) in fruit, the seed being nearly but not quite ripe.

Unfortunately, the weather was so unfavourable in the autumn that the seed did not arrive at full maturity. The characteristic fluorescence that the crushed seeds of *N. damascena* impart to petroleum spirit or to ether was, in consequence, if present at all, entirely masked by the greenish-yellow colour of the chlorophyll. In no part of either species could this fluorescent substance be detected.

I found that all the aerial parts of *N. sativa*, at every stage of development, contained notable quantities of melanthin, especially the leaves. The roots were, on the other hand, quite free from it at all periods.

In *N. damascena* I could find no trace of melanthin in the roots at any period or in the unripe seed; the leaves and the nearly ripe seed contained traces only of either that substance or one very similar.

Should *Nigella sativa* find a place amongst pharmaceutical drugs, the dried leaves would furnish a convenient material from which pharmaceutical preparations could be made. By this means we should utilize a part of the plant which is, I believe, at present wasted, and we should avoid employing a seed rich in fixed oil, always a source of annoyance to the pharmacist. In such case we should do well to examine carefully any supply of the leaves that might be sent to us from Germany.

AMERICAN DRUGS.*

BY J. MOELLER,

Botanist and Microscopist of the Imperial Forest Institute, Mariabrunn, near Vienna.

(*Continued from page* 745.)

FOLIA ARCTOSTAPHYLI GLAUCÆ (MANZANITA).

The leaves are almost uniformly elliptical or ovate, 25 to 40 mm. long, 15 to 25 mm. wide, with a short stem, ending in a small thorn-like point. They are thick and leathery, the margins slightly thickened and entire, smooth on both sides, somewhat shiny, pale green, the primary nerve with slightly prominent secondary nerves running to the margin, similarly delicately crimped and netted on both sides. The drug is odourless and tastes

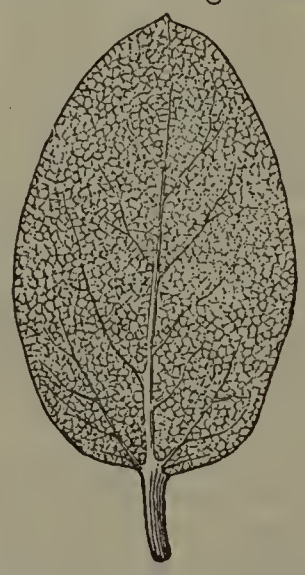

Fig. 11.—Upper side of the leaf of *Arctostaphylos glauca* (nat. size).

strong and bitter. Anatomically speaking, the leaves are interesting on account of the typically peculiar transverse arrangement of the vascular bundles. These have not the circular horizontal section, but linear and keep both sides of the leaf apart like props.

As the bast fibres do not reach the upper skin, their mechanical function is completed through layers composed of collenchymatic construction. These extend directly under the upper skin and even unite often with a structure of the neighbouring vascular collection of the same name. The leaf parenchyma contains a large quantity of tannin, which turns iron blue, but it has no specific points of secretion. I. H. Flint has found

* Reprinted from the *Therapeutic Gazette*.

"arbutin" in these leaves (*Vergl. Arch. d. Pharm.*, Bd. 213, S. 89).

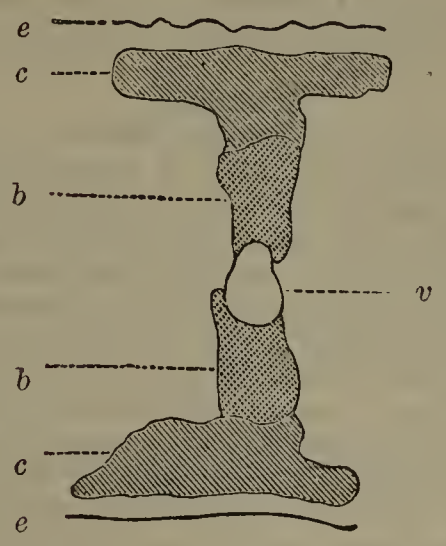

Fig. 12.—Transverse section of vascular bundles in the leaf of *Arctostaphylos glauca*:—*ee*, epidermis; *cc*, collenchyma layers; *bb*, bast bundles; *v*, central portion of the vascular bundle.

Manzanita leaves are readily distinguishable by their size and their bright colour from folia uvæ ursi, which latter have been introduced into all European pharmacies. The edge of the leaf and its nerves offer other further trustworthy earmarks by which to distinguish it. Nor is it easy to mistake it for any other kindred ericaceæ. The leaves of the *Arctostaphylos alpina*, Spr., are equal to them in size, but their edge is sharply identated, becoming fringy towards the stem. The parent plant of the manzanita leaves is the *Arctostaphylos glauca*, Lind., of California.

Ericaceæ.—This plant has long been known in California on account of its tonic and diuretic properties. It is particularly recommended in cases of catarrh of the urino-genital system, in cases of menorrhagia and incontinence of urine.

RADIX MAHONIÆ AQUIFOLIÆ.

Crooked cylindrical roots, generally from 10 to 15 mm. thick, cut for commerce into pieces, from 8 to 10 cm. long. The bark of these roots is almost 1 millimetre in thickness, of a greyish yellow colour, wrinkled lengthwise. The cylindrical pith is surrounded by layers of dense yellow wood substance. The magnifying glass enables us to detect the broad medullary rays which broaden outwards in the bark, and contrast darkly with

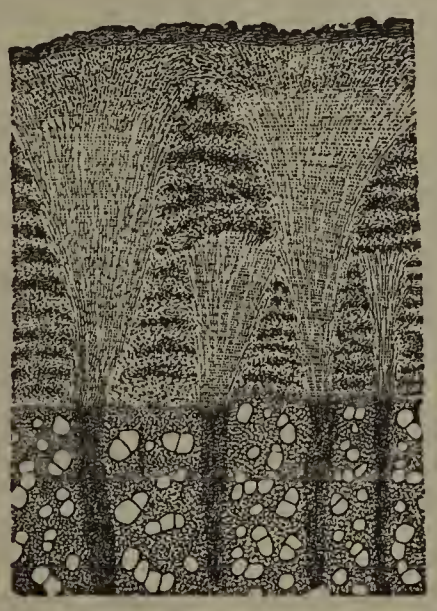

Fig. 13.—Section of the root of *Mahonia aquifolia*:—*b*, bark; *w*, wood.

the wood-rays, which latter are much broader and perforated by vascular pores. The bast-rays are concentrically stratified; the inner bark is homogeneous and covered with a thin dark-brown layer of a corky substance.

Microscopic Character.—The wood betrays scarcely any indication of the formation of the growth of a year. The vessels are irregularly distributed, often arranged tangentially to one another, much diversified in the lumen, but seldom exceeding 0·1 mm., with the diaphragm completely perforated, and the side walls profusely spotted and sometimes also spirally striped, and shortly scalariform (0·15 mm.). They are encased in thick-walled liber formation, woody parenchyma being scanty. All sclerotic elements are entirely absent in the young bark; the parenchyma becomes sclerotic in layers later on, giving the bark the appearance of being formed in layers of bast fibres, of which fibres the secondary bark is in reality totally free. The fibres of the parenchyma are remarkably short, often inseparably blended together into whetstone-shaped bundles, and seldom more than three-jointed. The primary medullary rays are ten to fifteen-rowed to begin with, and widen towards the exterior, reaching a width of 1 mm. and even more. As the plant grows older a secondary medullary ray can be found between each pair of bark-rays, which also acquire a respectable width as they proceed outward. The middle groups of cells of the medullary rays become sclerotic in bundles without changing the size and shape of the cells. The middle bark is composed of thin-walled, much elongated parenchyma cells, closely pressed together, and covered by a delicate layer of cork.

The parenchyma is filled with a yellow substance easily removed by washing, whilst the membranes of the sclerotic elements of the bark and wood are very intimately impregnated by the same, Bœdeker did not succeed in producing nitrate of berberin by his microchemic reaction. These roots furnish but faint traces of oxalate of lime, or of any crystals, although a proper treatment with sulphuric acid will generally produce a few gypsum needles. Starch is entirely absent, from which we are led to conclude that it is gathered in the summer season.

Mahonia Aquifolia, DC. (*Berberis Aquifolium*, Pursh.)—Berberideæ.—The parent plant of this drug is that very generally cultivated ornamental evergreen with pointed needle-like leaves (indigenous to North America, but also found wild in some parts of Europe), so closely allied to varieties of barberry. The plant is said to be distinguished from this and all other varieties of *Berberis* by the alkaloids which it contains, and to which it owes its medicinal properties. This alkaloid was discovered at the Michigan College of Medicine, by Professor Jungk, and represented as a yellow, amorphic substance, possessing an alkaline reaction, and having a strong bitter taste. The salt produced by it is white, notwithstanding the yellow colour of its base.

It is not yet known whether or not this alkaloid (called "mahonine," after the discoverer of the plant) is identical with the xanthopicrit (= berberine) obtained by Chevallier and Pelletan from xanthoxylum. It is well known that berberine is obtained from a series of plants differing considerably among themselves. This drug was first used in cases of syphilis some three years ago and is now much used and highly esteemed, especially in America. It is less effective in the first stages than after a preceding mercurial treatment. Extract of berberis, like iodide of potassium, seems to be a powerful adjunct to mercury, eliminating the latter from the system, together with the materies morbi. According to the American view, the beneficial results reached by this line of treatment are unquestionable, whatever may be thought of the theory as such. The preparation has also been successfully applied in all uninflamed chronic affections of the skin, and in chronic or subacute catarrh of the vagina and uterus, especially in those cases of endometritis which are marked by a secretion of albumen. There are a fluid and a solid extract known to commerce, 20 to 30 drops of the former, 3 to 6 grains of the latter, being the proper dose.

(*To be continued.*)

IN THE KAURI GUM FIELDS.*

Sombre, solemn, and grand are the kauri forests of Northern New Zealand. If you want beauty of mixed foliage, of wide-spreading, branching trees, all interlaced with knotted vines and tufts of rosy blossoms—forests where the golden sunlight steals in delicately-divided rays through the exquisite canopy of tall tree-ferns, to fall in radiant gleams on the carpet of all manner of silver-backed and other lovely ground-ferns—you will find these in perfection wherever the grievously "improving" hand of the settler has spared the primeval bush. Alas, that we should have to say, such precious visions of Eden are already few and far between—only to be found in the least frequented districts.

But the kauri forests are a thing altogether apart; and alas! indeed, of these also we must say that they are rapidly diminishing before the too busy axe of the lumberer. The kauri is the pine-tree of New Zealand, the sole representative of the coniferous family, and a very noble representative it is, though by no means answering to our ordinary notions of pine-trees, inasmuch as its foliage consists of leaves instead of needles; but it is tall and straight as a mast, and a very majestic mast, for these stately trees range from fifteen to fifty feet in girth, and attain a height of from a hundred to two hundred feet ere they commence throwing out the branches which form their crown of sombre green. This is a special industry peculiar to Northern New Zealand, and the precious gum is a semi-fossilized deposit which is found buried at a depth of five or six feet below the surface of the ground, on tracts of open land, where in bygone ages grew kauri forests which have long since disappeared. It is thought probable that these forests have been burnt, and that the exceeding heat liquefied the resin and caused it to flow more freely, for the digger is sometimes rewarded by finding a lump as big as his own body, though more frequently it lies buried in fragments from the size of an egg to that of a man's head.

The value of the gum varies with its colour, which is sometimes of a rich brown, sometimes bright amber, and occasionally almost like pale crystal. Sometimes it is clouded, sometimes quite clear, revealing flies and tiny beetles which, perhaps for ages, have been enshrined in its transparent depths. The clearest and most crystalline pieces fetch the highest prices, and are carved into ornaments hardly to be distinguished from amber, but very much more brittle. When these extra fine pieces have been selected, the rest is sold in the Auckland market at from £30 to £40 a ton, and is purchased by English and American manufacturers of varnish. The amount collected must be enormous, as the value of the annual export from the colony ranges from £70,000 to £200,000. None is found in the Southern Isle, nor, indeed, to the south of latitude of 37° 30′, which is the southernmost limit of the growth of the kauri.

Whether the special qualities of the buried gum are due to old age, or to the possible action of fire, is unknown; but that which is obtained from the living tree is altogether worthless for the market, being soft and sticky,—in fact, simple resin. Large quantities in this condition are sometimes found about the roots of growing trees in the forest; but of this very little can be turned to account.

At one time as many as two thousand men made their living as professional gum-diggers, but in these more settled days other occupations are found to be more remunerative, and a comparatively small number now adopt this as their regular employment,—those who do so being for the most part the unsettled, roving members of the community. They are a mixed lot,—of very much the same stamp as an average colony of gold-diggers. Bohemians of every nation, European. American, Australian, all find their way to the gum fields. There men of all classes rub shoulders; and a white-handed "swell" lately, perhaps, an over-extravagant officer in Her Majesty's service or an unworthy member of one of the universities, may deem himself fortunate should he chance to fall in with some sturdy navvy who will accept him as his pal.

* From *Lippincott's Monthly*. Reprinted from the *Oil, Paint and Drug Reporter*, March 26, 1884.

KEPHIR.*

BY PROFESSOR H. STRUVE.

Kephir is a beverage which is prepared by a peculiar process of fermentation from the milk of cows and other animals. It has been in use from time immemorial by the inhabitants of the northern declivities of the high Caucasian mountain range, to whom it possesses the same importance as koumis does to the nomades of the south-eastern steppes of Russia. The last-named beverage was for the first time brought to the notice of the scientific world in 1784, and since then it has been frequently the subject of investigations, but only within a few decades has it attained greater importance as a remedy.

On the other hand, kephir was, even in Russia, totally unknown until two years ago, although in 1867 Dr. Sipowitsh had made a short communication on this subject to the Caucasian Medical Society, which remained buried in the archives of the latter. Ten years later, in 1877, Dr. Shublowski published a more detailed paper on kephir which, however, failed to direct the attention of science or that of the public towards this new beverage; the proper impulse was first given from Moscow in 1881, almost a century after the first notice of koumis.

On December 1, 1881, Ed. Kern read a paper before the Imperial Society of Naturalists at Moscow (*Bull. Soc. Impér. des Natur. de Moscou*, 1881, p. 141) on "Kephir, a new milk ferment from the Caucasus," which he had collected during his travels. The requisite investigations had been made by Ed. Kern under the supervision and in the laboratory of Professor Goroshankin. The result is that, within the last two years, kephir was not only introduced as a medicine from the southern to the northern section of Russia; but that also a number of papers and pamphlets on this subject has been published. During the latter part of the past year kephir has also been noticed in other countries, among others by Professor Dr. F. Cohn, at the meeting held December 13, by the section for Natural Sciences of the Silesian Society at Breslau. Kephir has already become an article of speculation, is procurable in commerce, and will doubtless be further scientifically investigated. The narrow circle in which for centuries kephir has been harboured with almost religious piety, has been broken, and it has become public property, notwithstanding the method of its preparation is still surrounded with a certain mystery, depending upon the so-called kephir-grains, the new milk ferment of Kern. This can only be procured from the mountain tribes; but after it has been obtained, kephir may be prepared with the requisite precautions, at all times, in winter or in summer.

This present mystery concerning the origin and nature of the kephir-ferment invites further investigations, and it will doubtless not be a long time before the preparation of kephir in all its details will have been ranged with the known phenomena of fermentation in general. Then, most likely, this simple beverage and remedy of the mountain tribes of the high Caucasus will be accorded an important position among the domestic and general remedies, more particularly as towards koumis. But years of observation will be required to determine its true value; at present kephir is beginning to become a fashionable remedy.

The author has undertaken the chemical investigation of kephir with the view of applying to it the results of his protracted investigations of milk, and of determining the changes produced by this ferment; although more difficult and complicated than expected, he hopes in the near future to be able to report his results.

Tiflis, January 30, 1884.

* *Berichte d. deutschen chemischen Gesellschaft.*—Reprinted from the *American Journal of Pharmacy*.

The Pharmaceutical Journal.

SATURDAY, APRIL 26, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACY LAW IN ONTARIO.

AFTER experiencing failure in two previous attempts to obtain an amendment in the law regulating the practice of pharmacy and the sale of poisons in the province of Ontario that was passed in 1871, the pharmacists of that division of the Dominion of Canada have this session succeeded in securing their object. The course which legislation has taken on this occasion, though perhaps not a common one, is certainly conducive to simplicity, for instead of patching up the old Act with a series of amendments, it has been absolutely repealed and its provisions re-enacted with such modifications as experience has shown to be desirable. The provisions of the Act of 1871 may be found in the first volume of the present series of this Journal, and in accordance with what is now our usual practice in respect to colonial Pharmacy Acts, the text of the Act which supersedes it will be printed in a future number for permanent reference; but it may be convenient that we should here briefly summarize the new law and indicate the most important changes that have been effected, especially as some of them are in the direction contemplated in this country for the amendment of the Pharmacy Act, 1868.

In the first place provision is made for the continuance of the Ontario College of Pharmacy, which is reinvested with the duties of supervising the examinations and registration, and with authority to grant certificates of competency. It may be mentioned that membership of this College is involved in registration, and that every person registered under the Act becomes *de facto* a member, is entitled to call himself a pharmaceutical chemist, and has to pay for the uses of the College a yearly subscription of four dollars. In addition the new Act provides that a further sum of four dollars annually shall be paid on account of every branch establishment, and requires that all *employés* or assistants who manage or have charge of such additional places of business shall be legally qualified pharmaceutical chemists. Power has also been given to the Council to raise the fee for the qualifying examination from four to ten dollars. Only registered pharmaceutical chemists are legally authorized to compound prescriptions of legally authorized medical practitioners, or to keep an open shop for retailing, dispensing, or compounding poisons enumerated in a schedule, or to assume or use the title of "chemist and druggist," or "chemist," or "druggist," or "pharmacist," or "apothecary," or "dispensing chemist" or "druggist," in any part of the province of Ontario. As to the persons entitled to registration, it was provided in the Act of 1871 that this privilege should extend, without examination, to persons in business on their own account before the passing of the Act; or who had before that time served an apprenticeship of three years and acted as an assistant for one year. Under the new law this privilege is continued to such persons, upon payment of a fee of ten dollars, during another twelve months, after which it is to cease. Further, persons approved of by the Council of the College, who hold diplomas from the Pharmaceutical Society of Great Britain or certificates from any pharmaceutical college in the Dominion of Canada or elsewhere, may also be registered without examination. Any other person, before being eligible for registration, must pass an examination, for which hitherto there has been no requirement as to previous practical training. But henceforth a candidate will have to satisfy the Council that he has served as an apprentice to a regularly qualified pharmaceutical chemist for a term of three years, whilst any apprenticeship commenced subsequently to the passing of the present Act will have to be evidenced by a contract in writing, and the term of the apprenticeship will not be deemed to commence for the purposes of the Act until proof has been furnished to the Council that a suitable preliminary examination has been passed. Upon any person being registered under the Act he will be entitled to receive from the Ontario College of Pharmacy a certificate authorizing him to carry on business for a specified time, which, if carrying on business on his own account, he is to display in a conspicuous position in his shop; but no person who is in default in respect to the annual fee payable to the College will be entitled to exercise the privileges of a pharmaceutical chemist. In the event of the death of a person in business, his business may be carried on by an executor, administrator or trustee, if and so long as it is conducted by a qualified pharmaceutical chemist and the annual registration fee of four dollars continues to be paid. An important alteration has been made in the provision as to the penalty for offences under the Act, which is now definitely fixed at "twenty dollars and costs," instead of, as before, "not exceeding twenty dollars." This will probably help to curb the lenient propensities of magistrates which result sometimes in practically fining the prosecutor instead of the offender.

The provisions as to the sale of poisons are, in the main, similar to those in our own Pharmacy Act, save that there is no exemption in favour of patent medicines. Potassium cyanide does not appear in

the first part of the poison schedule, but this part includes Indian hemp, digitalin and cedar oil. In the second part neither essential oil of almonds nor red or white precipitate occur, but it contains several substances not included in the British schedule,—carbolic acid, calabar beans, St. Ignatius' beans, pink root, podophyllin, ether, iodine, potassium iodide and potassium bromide. Paregoric is specially excluded from the opium preparations subject to the regulations. One subject of controversy during the passage of the Bill through the legislature seems to have been the arsenical insecticides, such as "Paris green" and "London purple," which are now so extensively used by agriculturists in North America. It was contended that it would be against the public interest and convenience that the supply of these substances should become a monopoly in the hands of chemists and druggists, and, eventually, this view of the case prevailed, for it is provided that nothing in the Act shall prevent the sale by persons not registered of the arsenical insecticides, so long as they are sold in well-secured packages, distinctly labelled with the name and address of the seller and marked "poison," and a record of each sale is kept by the seller. The Committee charged with the conduct of the Bill appear to have pressed very strongly the argument that druggists are alone qualified to sell such poisonous compounds, but to little avail; it was found that some compromise on this point was the price that would have to be paid for the new law, and the regulation as to labelling was the result. The question is not unlike one that was recently argued in this country, and may come up again before long. It is, therefore, of interest to note the spirit in which this settlement has been accepted by the Ontario chemists. The *Canadian Pharmaceutical Journal* says:—"By this arrangement a right has been conceded which was so questionable as not to bear assertion, and was practically inoperative. Druggists will continue to sell as great a proportion of these insecticides as ever they did, and from the restrictions surrounding their sale by other dealers will no doubt in the end secure the great bulk of the trade." In conclusion, there is a provision that all compounds named in the British Pharmacopœia shall be prepared according to the formulæ directed in the latest published edition of that work, "unless the College of Physicians and Surgeons of this province select another standard," or unless the label distinctly shows that the compound is prepared according to another formula.

BOTANICAL LECTURES AND PRACTICAL DEMONSTRATIONS AT THE GARDENS OF THE ROYAL BOTANIC SOCIETY OF LONDON.

It will be noticed, by reference to the advertisement of the School of Pharmacy of Great Britain in the present number of this Journal, that Professor Bentley will commence his course of lectures and demonstrations on "Systematic and Practical Botany," at the Gardens of the Royal Botanic Society, in Regent's Park, on Saturday morning next, May 3, at eight o'clock. The lectures will be continued on the succeeding Friday and Saturday mornings, at the same hour until the end of July.

We have been favoured with a copy of the Calendar of the Pharmaceutical Society of Ireland for 1884, and regret to observe from the "Statistics" that although the number of pharmaceutical chemists on the Register, as compared with the previous year, has increased from 219 to 234, the number of Members of the Society has again decreased, from 81 to 71.

* * *

From the Annual Report of the Pharmacy Board for Victoria it appears that during the year 1883 ten persons presented themselves for the "major" examination (there is no "minor") of whom nine passed. A candidate to be eligible for this examination must previously have served as an apprentice for not less than four years, attended one course of lectures, passed examinations in the University of Melbourne, or some school or college recognized by the Board, in the subjects of materia medica, medical botany and practical chemistry, and passed an examination in practical pharmacy before the Board. The same number went up for the "modified" examination, open to persons who have served three years' apprenticeship to a chemist and druggist, of which term three months had been completed at the time of the passing of the Act, and of them seven passed. The candidates for the "preliminary" examination, which is compulsory before the commencement of an apprenticeship, numbered 44, and 21 passed. It is stated that of the total number of persons registered under the Victoria Pharmacy Act in the four years 1880–83, inclusive, 14 passed the "major" and 41 the "modified" examination of Victoria; 29 were registered under certificates from the Pharmaceutical Society of Great Britain, and one under a certificate from the Pharmaceutical Society of Ireland; five qualified by foreign diplomas, and 42 were registered as having been in business in the colony before the passing of the Act.

* * *

We willingly call attention to the report upon another page of the formation at Manchester of a Pharmacy Students' Association "for the promotion of intercourse amongst chemists' assistants, apprentices and others in any way connected with pharmacy, and the discussion of subjects tending to the welfare of all interested in pharmacy." It will be seen that the young Association has adopted the plan of appointing "Reporters" to keep the members acquainted with what is being done in botany, chemistry, materia medica and pharmacy, which constitutes one of the best means of providing a good supply of useful information for those who attend the meetings.

* * *

From a recently issued Report of the Commissioners of Customs it appears that during the year ending March 31, 1883, the gross amount of duty collected upon chloral hydrate (3*s.* per lb.) imported into the United Kingdom amounted to £965, being a decrease of £39 as compared with the previous year. Chloroform yielded during the same time a revenue of £11 (14*s.* per gallon); sulphuric ether, £17 (25*s.* per gallon); iodide of ethyl, £1 (13*s.* per gallon); and collodion, £2 (24*s.* per gallon). Besides these sums, £167 was collected on transparent soap in the manufacture of which spirit had been used (3*d.* per lb.), showing a falling off of £98.

* * *

The Report on the Progress and Condition of the Royal Gardens at Kew during 1882, the preparation

of which was unusually delayed in consequence of the pressure of official duties, shows that in the course of that year the visitors amounted to 1,244,167, a number enormously larger than that recorded in any previous year, and nearly half as many again as in 1881. On Whit Monday more visitors (95,300) entered the gardens than had ever before been admitted in a single day. It is gratifying to find that notwithstanding the unprecedented number of visitors in 1882, and the absolute freedom with which every part of the establishment is made accessible, the Director is able to report that the amount of damage which the collections suffered may be described as practically *nil*.

* * *

We notice that among the topics treated of in the Report is that of the cinchona nomenclature, and there is a decided expression of opinion in favour of Dr. Trimen's conclusions. Some interesting information is also given respecting the cultivation of jalap in Jamaica, and several other similar subjects.

* * *

As a consequence of the proposal referred to last week, as having been put forward in Massachusetts, to make the United States Dispensatory the authoritative standard as to the quality of drugs, a remonstrance, signed by the President and all the living ex-Presidents of the Massachusetts Medical Society, has been presented to the Senate and House of Representatives, urging that "the United States Pharmacopœia should be the only standard for the preparation and sale of drugs and medicines," and protesting against any present alteration of the Adulteration Act in force in the State.

* * *

According to the *Weekly Drugs News* four separate robberies have been effected in Denver by a man, whose method of operating was first to rouse a pharmacist after business hours and then to present a loaded revolver instead of a prescription. It is satisfactory to learn that the largest haul made by the miscreant only amounted to fifty dollars and a box of cigars; but probably this loss will be sufficient to engender caution in the local pharmacists who may in future be summoned by the night bell.

* * *

It is reported that a patent has been taken out in Germany for an electric process of preparing metallic aluminium, by which it will be possible to produce it at about one-fourth of the present cost.

* * *

At the next meeting of the Chemical Society, to be held on Thursday, May 1, a paper will be read on "Benzoylactic Acid and some of its Derivatives" (Part I.), by W. H. Perkin, jun., Ph.D., and one on "Fluorene," by W. R. E. Hodgkinson.

* * *

The last meeting of the session of the Manchester Pharmaceutical Association will be held at the Owens College (Medical Theatre, Oxford Road entrance), on Tuesday evening next, April 29, at 7·30 p.m., when a paper will be read on "Coal: The Products of its Distillation and the Manufacture of Coal Gas" (illustrated with experiments and the oxhydrogen lantern), by A. W. Duncan, F.C.S., and F. C. J. Bird.

* * *

A meeting of the School of Pharmacy Students' Association will be held an Thursday, May 1, at 8 p.m., when a paper on "Blood" will be read by Mr. Charles Shapley, and a Report on Materia Medica will be made by Mr. W. Elborne.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held on Wednesday, April 23, 1884, the report of the College of Preceptors on the examination held on April 8th was received.

Three hundred and seventy-five candidates had presented themselves for examination, of whom *two hundred* had failed. The following *one hundred and seventy-five* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

Annis, Ernest George .....Leicester.
Appleby, Geo. Henry Vane ...Sunderland.
Appleton, Arthur .....Driffield.
Armitage, George.....York.
Arrandale, James William.....Denton.
Askew, Frederic .....Workington.
Aspinall, Hortensius .....Liverpool.
Bailey, Willis .....Eastry.
Bilmford, John Thomas..... Longwood.
Barden, Tedbar.....Dewsbury.
Bartholomew, Edwin Robert ...Ludlow.
Barrett, Edith .....Daventry.
Barrett, William Louis .....Portsmouth.
Beattie, James B.....Fife.
Beck, John Frederick .....Honiton.
Blakemore, John Bowen.....Oakengates.
Blayney, William H. .....Haslingden.
Blissett, Francis Homan.....Bristol.
Brett, George .....Louth.
Brookes, John Humphrey .....Chesterfield.
Burgess, Llewellyn Ernest .....Aberavon.
Burnett, George .....Great Broughton.
Butterfield, Thomas A. C. .....Keighley.
Carpenter, Albert Hemsley ...London.
Carron, Herbert Burgess .....Leyton.
Caunt, John William .....Derby.
Clark, James.....Thornhill.
Collins, Joseph .....Catterick.
Cook, Harry ....Barrow-in-Furness.
Cooke, Charles Fowler.....Sileby.
Cooper, Frederick William.....Brightlingsea.
Corfe, Robert .....Maidstone.
Croft, Duterau .....Middleham.
Crosdale, Robert Morgan .....Oldham.
Cross, Edward Robert.....Scarborough.
Dalziel, Charles Michie .....Aberdeen.
Darlington, Thomas.....Haslington.
Davies, John Albert .....Aberystwith.
Dewey, Thomas Henry .....Merton.
Draper, Arthur Longfellow.....Brigg.
Durno, Alexander Emslie .....Aberdeen.
Edwards, Edward.....Brecon.
Edwards, Edward.....Cardiff.
Edwards, Walter .....London.
Emett, Thomas.....Fulwood.
Enness, Walter Frederick .....London.
Ettles, Wm. James McCulloch.Elgin.
Evans, Alfred Philip .....London.
Evans, Francis Richard A.....West Bromwich.
Ferguson, Thomas .....Stirling.
Ford, Frederick Charles .....Kilsby.
Freeman, John.....Tetbury.
Gartside, Charles .....Oldham.
Gelling, John Alexander.....Douglas.
Gifford, James ... .Blackburn.
Gilderdale, Frederick ... .Wakefield.
Goodwin, James .....Nuneaton.
Gourlay, John .....Montrose.
Greenhalgh, Thomas Earnest ...Blackpool.
Greenwood, William Russell ...Howden.
Gross, Walter Henry .....Northampton.

Hall, Robert .....Market Rasen.
Halmshaw, William.....Brigg.
Harbottle, Bernard .....Alnwick.
Harding, Charles Thomas .....London.
Harries, Benjamin .....Llandilo.
Harrison, Arthur Neville .....Dowlais.
Harwood, Thomas William ...Driffield.
Haynes, Edward Thomas .....Oxford.
Hearne, William Gustavus.....Redhill.
Hedley, Charles Richard.....Newcastle-on-Tyne.
Herrington, Edmund William..Reading.
Hill, Malcolm .....Glasgow.
Hodder, George William.....Frome.
Holgate, Herbert.....Catterick.
Hounam, Christopher .....Langholm.
Hutchin, Llewellyn Albert Jas.Saffron Walden.
Hutton, Frank Danks.....Dunfermline.
Jenkins, William .....St. Dogmaels.
Jones, Hugh Kyffin.....Mochdre.
Jones, Lewis.....Aberdovey.
Jones, Thomas John .....Holyhead.
Jones, William.....Aberystwith.
Kenderdine, Alfred George ...Stafford.
Kent, Thomas Oliver .....Wye.
Kent, Wm. Hy. Plaisted .....East Molesey.
Kidd, Walter John .....Halifax.
Kinnear, James Arthur .....Dundee.
Kirkby, Thomas Henry .....Marshchapel.
Langford, Frederick Charles ...London.
Leech, Charles Richard .....Cambridge.
Lloyd, Benjamin Caradoc .....Flint.
Lloyd, Richard Edward .....Garston.
London, Walter Augustus .....Redditch.
Longstaff, William Edwin .....Silloth.
McCardell, James.....Glasgow.
McIntyre, Francis Gibb .....Glasgow.
McKerrow, William James ...Aberdeen.
McLaren, Frederic Donald.....Beverley.
Maggs, Arthur Samuel .....St. Leonards on Sea.
Marshall, Rupert Henry.....Walsall.
Matthews, Henry Gilbert .....London.
Mawer, William Fred.....Grimsby.
May, James .....Musselburgh.
Middleton, Richard Watson ...Ilkley.
Millar, James Herd.....Edinburgh.
Miller, Richard .....Preston.
Minet, Alfred .....London.
Mingay, Adolphus Alfred .....Burton-on-Trent.
Mitchell, John Albert.....Bradford.
Nettleton, George William.....Brighouse.
Nidd, John Henry .....Boston.
Northwood, Herbert Wm. W...Arundel.
Ogilvie, James Hay.....Aberdeen.
Oliphant, Edward .....Grange.
Ord, Bertram Thomas.....Gateshead.
Ough, Lewis.....Plymouth.
Owen, Griffith Charles .....Carmarthen.
Palmer, George William... .....Ely.
Palmer, James .....Oxford.
Pearson, Ernest .....Cromford.
Perrett, Frederick James .....Weston-Super-Mare.
Peterkin, Charles John .....Elgin.
Phillips, Thomas .....St. Clears.
Pinckney, Charles Edward.....Peterborough.
Pole, William .....Shetland.
Ramsden, Thomas Prince .....Pontefract.
Rideal, Frank .....Hyde.
Robertson, Alexander .....Elgin.
Robertson, Thomas Cannon ...Oban.
Robin, Hugh Millar .....Perth.
Roe, George .....London.
Rugg, Walter James .....London.
Scorgie, John .....Ellon.
Scott, William Robert.....Galashiels.
Scowby, Joseph Newsome .....Sheffield.
Shillcock, Sydney.....Bromley, Kent.
Silversides, Richd. B. Garbutt Darlington.
Sim, David .....Dundee.
Smith, Edward Charles .....London.
Smith, Harry George ..... Downham Market.
Smith, Robert .....Forres.
Southall, Harold William .....Birmingham.
Southall, John Edmund .....Birmingham.
Stansfield, John Mills .....Birkdale.
Stewart, Hawthorn .....Ayr.
Streatfield, Edward Henry.....Maidstone.
Stubbins, Henry .....Brigg.
Sturton, Charles Hubert.....London.
Taylor, Richard Noble.....Barrow-in-Furness.
Tharratt, George .....Louth.
Thomas, Owen Edward .....Bangor.
Thomson, Robert Greig .....Buckhaven.
Tupholme, John James .....Spilsby.
Turpin, Ernest .....London.
Tweedie, Thomas Shortridge ...Annan.
Vincent, William ....Truro.
Vinden, Frederick William.....London.
Voisin, Ernest Osmond B. .....Jersey.
Walker, James .....Aberdeen.
Walker, William Henry .....Willenhall.
Wansbrough, Edwin George L. Barrow-in-Furness.
Ward, Oswald Thomas .....Diss.
Watson, William Henry .....Spennymoor.
Webster, Thomas Findlater ...London.
Werner, Emil Alphonse .....Dublin.
Wheeldon, Edwin.....Warrington.
Wight, William ....Alnwick.
Willoughby, Samuel Walton ...Plymouth.
Wilson, John Henry .....Coventry.
Wilson, John Woolhouse .....London.
Woodruff, Thomas .....Stalybridge.
Woodward, William .....London.
Young, Edward Francis .....Portishead.
Young, George Herbert .....Brigg

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

	Candidates.		
	Examined.	Passed.	Failed.
Aberdeen	14	9	5
Birmingham	17	8	9
Brighton	4	1	3
Bristol	9	5	4
Cambridge	7	5	2
Canterbury	4	2	2
Cardiff	12	4	8
Carlisle	7	4	3
Carmarthen	13	6	7
Carnarvon	10	4	6
Darlington	8	4	4
Douglas	3	1	2
Dundee	8	5	3
Edinburgh	26	6	20
Exeter	8	2	6
Glasgow	17	7	10
Guernsey	1	0	1
Hull	12	9	3
Inverness	5	3	2
Jersey	2	1	1
Lancaster	6	5	1
Leeds	17	9	8
Lincoln	11	6	5
Liverpool	15	5	10
London	54	30	24
Manchester	24	9	15
Newcastle-on-T.	9	5	4
Northampton	3	1	2
Norwich	7	1	6
Nottingham	12	4	8
Oxford	2	2	0
Peterborough	3	1	2
Sheffield	6	2	4
Shrewsbury	5	3	2
Southampton	4	1	3
Truro	2	2	0
Worcester	2	0	2
York	6	3	3

The questions set for examination were as follows:—

LATIN.

(*Time allowed—from* 11 *a.m. to* 12.30 *p.m.*)

I. Translate into English either A (Cæsar) or B. (Virgil).

The Candidate must not attempt both.

A. CÆSAR.

(i.) Ita ancipiti proelio diu atque acriter pugnatum est Diutius quum nostrorum impetus sustinere non possent

alteri se, ut coeperant, in montem *receperunt:* alteri ad impedimenta et carros suos se *contulerunt.* Nam hoc toto proelio, quum ab hora septima ad vesperum pugnatum sit, aversum hostem videre nemo potuit. Ad multam noctem etiam ad impedimenta pugnatum est, propterea quod pro vallo carros objecerant, et e loco superiore in nostros venientes tela *conjiciebant*, et nonnulli inter carros rotasque, maturas ac tragulas subjiciebant nostrosqui vulnerabant.

(ii.) Hoc proelio trans Rhenum nuntiato, Suevi, qui ad ripas Rheni *venerant*, domum reverti *coeperunt;* quos Ubii, qui proximi Rhenum incolunt, perterritos insecuti, magnum ex his numerum *occiderunt.* Caesar, una aestate duobus maximis bellis confectis, maturius paulo, quam tempus anni postulabat, in hiberna in Sequanos exercitum deduxit: hibernis Labienum praeposuit; ipse in citeriorem Galliam ad conventus agendos profectus est.

II. Grammatical Questions.

(*For those Candidates who take Cæsar*)

1. Give the principal parts of the verbs in italics.
2. Decline *impetus, impedimenta, aestate,* and *maximis bellis.*
3. Give the three degrees of comparison of all the adjectives in the above extracts.
4. What is the difference between *in montem* and *in monte?*
5. What do you know of *Labienus?* Who were the *Suevi* and *Sequani?*

B. Virgil.

I. Translate into English:—

(i.) Aeole (namque tibi divum pater atque hominum rex
Et *mulcere dedit* fluctus, et *tollere* vento),
Gens inimica mihi Tyrrhenum navigat aequor;
Ilium in Italiam portans, victosque Penates:
Incute vim ventis, submersasque obrue puppes,
Aut *age* diversos, et *disjice* corpora ponto.
Sunt mihi bis septem praestanti corpore nymphae,
Quarum, quae forma pulcherrima Deïopeiam
Connubio jungam stabili, proprimaque dicabo.

(ii.) At domus interior regali splendida luxu
Instruitur, mediisque parant convivia tectis.
Arte laboratae vestes, ostroque superbo;
Ingens argentum mensis, caelataque in auro
Fortia facta patrum, series longissima rerum,
Per tot ducta viros antiqua ab origine gentis.

II. Grammatical Questions.

(*For those Candidates who take Virgil.*)

1. Give the principal parts of the verbs in italics.
2. Decline throughout *vis, rerum, domus* and *praestanti corpore.*
3. Give the three degrees of comparison of all the adjectives in extract (ii.)
4. Give the case and construction of *tibi, vento, ventis, Deïopeiam propriam* (extract i.)
5. Who was *Aeolus?* Where was *Tyrrhenum aequor?* and what were *Penates?*

(*For all Candidates*).

III. Translate into Latin:—

1. This life of ours is short, but that one is immortal. 2. We often walked in the garden in order that we might refresh ourselves. 3. The generals were punished because they had not buried the bodies. 4. I wish to learn where the camp of the enemy is. 5. We must pray that all things may be well.

ARITHMETIC.

(*Time allowed—from* 12.30 *p.m. to* 2 *p.m.*)

1. A gentleman, whose average expenditure is £3. 4*s.* 9¼*d.* per week, saves every calendar month £15. 7*s.*; find his annual income.
2. Reduce to its simplest form

$$\frac{5\frac{5}{6}}{7\frac{7}{8}} \text{ of } 3 \times \frac{1-\frac{1}{10}}{7\frac{7}{8}-5\frac{5}{6}}$$

3. Divide 9·614 by ·0000019; and $\frac{2\frac{1}{5}}{5\frac{1}{2}}$ by ·003̇.
4. Reduce 11 cwt. 19 lbs. to the decimal of 10 tons 1 cwt. 6 lbs.
5. If 1 decalitre of wheat makes 6 kilog. 68 decag. of bread, how much wheat will be required to make 59 myriag. 1 kilog. 788 gr. of bread of the same quality?
6. Twenty navvies can dig a trench 160 metres long, 2 m. broad, and 1 m. 2 decim. deep, in 8 days; in how many days will twenty-four navvies dig a similar trench 90 m. long, 1 m. 80 centim. broad, and 1 m. 6 decim. deep?
7. How many pieces (12 yards each) of paper, 1 ft. 9 in. wide, would be required for a room measuring 37 ft. 7 in. by 27 ft. 9 in. and 13 ft. 6 in. high; and what will it cost at 7½*d.* a yard.

ENGLISH.

(*Time allowed—from* 3 *p.m to* 4.30 *p.m.*)

1. Enumerate the personal pronouns, simple and compound.
2. Give illustrations of the use of the verbs *set* and *sit*; and mention any similar pairs, with their past tenses and past participles.
3. Analyse the following sentence:—

"No surly porter stands, in guilty state,
To spurn imploring famine from the gate."

4. Parse fully the following sentence:—

"O yes, I have felt a proud emotion swell,
That I was British born."

5. Punctuate the following passage, and, where necessary, put in capital letters:—at any rate i made up my mind to be so dreadfully industrious that i would leave myself not a moment's leisure to be low-spirited for i naturally said esther you to be low-spirited you and it really was time to say so for i yes i really did see myself in the glass almost crying as if you had anything to make you unhappy instead of everything to make you happy you ungrateful heart said i.
6. Write briefly the life of some eminent English statesman or soldier (*one* only) of the present century, *or* give a short outline of recent events in the Soudan.

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A lecture was delivered at the rooms of the above Association on Wednesday evening, April 9, by Mr. G. M. Winter, on "Benzine Derivatives." Mr. J. J. Edwards presided.

The lecturer, having explained the nature of hydrocarbons and carbohydrates, said it was with the former class of bodies he was about to deal; he briefly demonstrated the chemistry of the paraffin, olefine, and acetyline series. Passing to the benzine series he explained the manufacture, chemistry, and properties of benzine and toluine. In the second part of the lecture he dealt with the chemistry of the alcohols and amines. The lecture, which was illustrated with numerous diagrams, was listened to with marked attention, and at the conclusion a hearty vote of thanks was accorded to the lecturer.

LIVERPOOL REGISTERED CHEMISTS' TRADE ASSOCIATION.

The ninth annual meeting of the Registered Chemists' Trade Association of Liverpool was held at the Royal Institution, Colquitt Street, on Thursday, April 3, 1884, the President, Dr. C. Symes, in the chair.

The following Annual Report of the Committee was presented as follows:—

"In placing before the members of the Association a

résumé of the proceedings during the ninth year of its existence, the Committee have to remark that various important matters affecting the general interests of the trade have arisen, to which they have given careful attention. Intimation was received towards the close of last session of Parliament that the Medical Acts Amendment Bill would be brought before the House, and that it was desirable a clause should be inserted giving pharmacists a position upon the Pharmacopœia Committee. Immediate action was taken in the matter, resulting in a petition—to which two hundred and fifty signatures were attached in favour of such clauses—being sent to the senior member, Mr. Whitley, for presentation to Parliament. Letters pointing out the advantage of having on the Committee those who possessed a practical knowledge of this work were also written to Lord C. J. Hamilton and Mr. S. Smith, asking their favourable consideration of the proposed amendments, from whom replies promising support were received. Owing to the press of business this Bill was postponed until the present session; it is now passing through Committee and further action may be necessary. That the Members of Parliament should be more fully informed of our requirements, the Secretary was requested to obtain and forward to them Professor Attfield's addresses, delivered at Southampton and Southport. This has been done, and copies have been sent to the representatives of Liverpool, Western Division of Lancashire and Birkenhead. Attention having been directed in the recent poisoning case to the sale of fly papers containing arsenic, it was thought desirable in the interests of the trade to issue a circular cautioning chemists against the sale of such papers. The Benevolent Fund of the Pharmaceutical Society having strong claims upon us collectively as well as individually, a donation of £2 2*s.* has been forwarded by the Treasurer from the funds of our Association. The annual supper took place on November 15, 1883, accompanied with excellent music and recitations. It was considered one of the most successful of the series. Continued demand for 'The Liverpool Price List' has necessitated a re-issue. The sixth edition is now in the hands of the printer, and will be ready for sale during the present month. The Committee are pleased to report an increased number of members, showing that the steady and progressive work of the Association is being appreciated. The Treasurer's statement of accounts, duly audited, shows a balance of £19 9*s.* 2*d.*, exclusive of £2 7*s.* 6*d.* due for Price Lists, in favour of the Association."

The Treasurer's financial statement, duly audited, having also been read, it was proposed by Mr. J. Woodcock, seconded by Mr. Turner, and carried,—"That the report and financial statement be adopted, and that the Secretary be instructed to have them printed and a copy sent to every chemist in Liverpool, Birkenhead and neighbourhood."

Mr. J. Woodcock proposed, Mr. J. J. Smith seconded, the election of Dr. Symes as President, which was carried unanimously.

The retiring members of the Committee, Messrs. Ellithorne, Hocken, Parkinson, A. Redford, Turner, and Warhurst, were re-elected, and Mr. G. Alexander was elected to fill the place of Mr. W. Parry.

Votes of thanks to the officers for their services in the past year having been passed, the proceedings terminated.

MANCHESTER PHARMACY STUDENTS' ASSOCIATION.

A meeting of chemists' assistants and apprentices took place at the Young Men's Christian Association, Peter Street, Manchester, on Tuesday, March 11, to consider the advisability of forming an association for the benefit of the junior pharmacists and apprentices of the city and suburbs. The unanimous opinion being that such an association was desirable, the business of drawing up rules and electing officers was immediately proceeded with, it being also resolved to ask Mr. A. H. Jackson, B.Sc., to accept the presidency of the Association.

At a subsequent meeting, held (by permission of the Council) in the Materia Medica Museum, Owens College, Mr. Alfred H. Jackson was elected President.

The following form the Committee for the ensuing year:—

President, A. H. Jackson, B.Sc.; Vice-Presidents, W. Elborne, A. W. Duncan; Honorary Treasurer, J. W. Hughes; Committee, F. A. Astley, C. H. Griffiths, J. E. Milford, A. B. Rhodes; Reporters, W. Kirkby (Botany), A. W. Duncan, F.C.S. (Chemistry), W. Elborne (Materia Medica), F. C. J. Bird (Pharmacy); Honorary Secretary, F. C. J. Bird, 8, Herbert Street, Cheetham.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Pharmaceutical Chemistry Class of the above Association, which has been under the able tuition of Professor Clowes, D.Sc., F.I.C., having just concluded a most successful term at the University College, the students were put through a practical and written examination, occupying two evenings, by their teacher.

The following are the names of those who have been successful:—

Prize and Certificate	1st. Mr. John F. Liverseege.
Certificates	2nd. Mr. James Stanley.
	3rd. Mr. Geo. W. Harris.
	4th. Mr. Edwin Roe.
	5th. Mr. Chas. J. Fryer.
	6th. Mr. F. C. Hemming.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, April 17. Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificates were read for the first time:—Messrs. W. Alabaster and E. L. C. Muspratt.

During the evening a ballot was held, and the following gentlemen were declared by the Scrutators, Dr. Miller and Mr. Louis, duly elected Fellows of the Society:—Messrs. J. P. Battershall, W. D. Borland, J. C. Bose, W. D. Crumbie, A. F. Dimmock, H. G. Greenish, W. J. Grey, J. Gaskell, J. W. Pratt, A. G. Perkin, W. H. Perkin, jun., and G. H. Wainwright.

Dr. Percy F. Frankland then read a paper—

On the Influence of Incombustible Diluents on the Illuminating Power of Ethylene.—The present communication forms a sequel to a paper read by the author "On the Illuminating Power of Ethylene when Burnt with Combustible Non-Luminous Diluents" (*Chem. Soc. Journ.*, Jan., 1884). In all cases the gases were consumed from a Referee's burner. Great care was taken to ensure the purity of the ethylene and the diluents (carbonic anhydride, nitrogen, oxygen and atmospheric air) employed. The author records his observations in a series of tables and curves. He sums up the principal results as follows:—Mixtures of ethylene, with the incombustible diluents, carbonic anhydride, nitrogen, aqueous vapour and atmospheric air, possess a lower illuminating power than pure ethylene. In all mixtures of ethylene with either carbonic anhydride, nitrogen or aqueous vapour, the intrinsic luminosity of the ethylene is reduced. In mixtures of ethylene with atmospheric air the intrinsic luminosity of the ethylene remains unimpaired until the air forms about 50 per cent. of the mixture. Mixtures of ethylene with oxygen in insufficient quantity to form an explosive mixture, possess a greater illuminating power than pure ethylene, the intrinsic luminosity of the

ethylene being greatly increased. The disilluminating effects of carbonic anhydride, nitrogen and water vapour are due partly to dilution and partly to refrigeration, *i.e.*, the cooling occasioned by the introduction of inert gas into the flame. This refrigeration is proportional to the specific heats of the gases, but in the case of carbonic anhydride and aqueous vapour, it is augmented by the absorption of heat, which takes place in the dissociation of the aqueous vapour, and in the reduction of the carbonic anhydride to carbonic oxide. Of the four diluents, carbonic anhydride, nitrogen, aqueous vapour, atmospheric air, the first is the most and the last is the least prejudicial to the illuminating power; nitrogen and atmospheric air, however, become more equalized in their effects, as the proportion in which they are present increases, complete disillumination of the ethylene being effected by the same proportion of each.

Mr. Cross then communicated a paper—

On Trichloropyrogallol. By C. S. S. Webster.—Messrs. Cross and Bevan found that by the action of chlorine upon lignose and bastose chlorinated derivatives were obtained, similar in properties and composition to the derivatives obtained by the action of chlorine upon various astringent substances of natural origin; but while the latter are made up for the most part of compounds which are aromatic in the strict sense of the word, the former contain no compounds of this order, but are converted into such under the action of chlorine. These authors also found that the amorphous chlorinated derivative from bastose had certain features of resemblance to the mairogallol of Stenhouse and Groves. The author of the present paper was therefore induced to reinvestigate the formation of this mairogallol. He finds that the reaction by which it is formed is divisible into two stages, which can be separated. In the first a trichloropyrogallol is formed, and it is this compound which subsequently undergoes condensation to the C_{18} derivative in question. This body, $C_6Cl_3(HO)_3 3H_2O$, was prepared as follows:—To 5 grams of pyrogallol 12 c.c. of strong acetic acid are added, the mixture is kept cool and a rapid current of dry chlorine is passed through; in about half an hour the new compound separates as a semi-solid mass of fine needles. The reactions of this body are almost identical with those of tribromopyrogallol, giving a deep blue coloration with baryta water, etc. The author has also prepared mairogallol, leucogallol, xanthogallol and tribromopyrogallol, and confirms the statements of Stenhouse and Groves in almost every particular. He has, however, improved the yield of these substances by slightly modifying the original processes.

The Secretary then read the following papers:—

The Synthesis of Galena by Means of Thiocarbamide. By J. Emerson Reynolds.—Some time since the author noticed that when sulphur urea was heated with an alkaline solution of lead hydrate the lead sulphide was thrown down in a specular layer. In the present paper he gives the best method of obtaining this specular coating on glass, brass, etc. Two solutions are used; one contains 90 grams of sodium hydrate and 75 grams of lead tartrate in a litre of water, the other contains 17 grams of sulphur urea in a litre. Equal volumes of the two solutions are mixed and heated in a clean beaker; at about 50°, a specular layer, which is at first silvery and translucent, forms on the vessel; it thickens as the temperature rises and becomes opaque, resembling a brilliant face of a crystal of native galena. The excess of the sulphide separates out after boiling a short time as a very dense easily washed precipitate having the appearance of very finely powdered galena. The author hopes to be able to utilize this separation for analytical purposes. The coating adheres with considerable tenacity to glass, brass, etc., and when the patent rights which control the production of ammonium sulphocyanide lapse this galena plating may be advantageously applied to many useful purposes. Two glass vases, one coated externally, the other internally, and a piece of brass tube plated with galena were exhibited.

Dr. Armstrong said that the author gave no proof that this coating really consisted of galena, *i.e.*, crystallized lead sulphide.

On the Analysis of Woodall Spa. By W. T. Wright.—Woodall lies about midway between Lincoln and Boston. In 1811 a boring was made for coal which was abandoned at 277 yards owing to the rising of a spring. This spring has since acquired some reputation as a medicinal remedy for gout, rheumatism, etc. Its properties are apparently due to the bromine and iodine which it contains. The spring was analysed by Dr. Frankland in 1875. The author gives a very complete analysis of the water. It contains 11113·73 parts per million of chlorine, 49·7 of bromine, and 5·21 of iodine. The spring is much richer in iodine and bromine than any other in this country. The author also gives a short account of the geological structure of the district.

On the Critical Temperature of Heptane. By T. E. Thorpe and A. W. Rücker.—In a previous paper one of the authors carefully determined the superficial tension of heptane, which was in c. g. s. units at 0° 22·19. From this number the critical point of heptane was calculated to be 281°. Pawleski has shown that a constant difference exists between the critical temperature and boiling points of strictly homologous compounds. This difference is in the case of hexane 182·3°. Normal heptane boils at 98·4° which, added to the constant 182·3°, gives 280·7° as the critical point of heptane.

The Society then adjourned to May 1.

Parliamentary and Law Proceedings.

Prosecution under the 17th Section of the Pharmacy Act.

At the Peterborough Petty Sessions, on Wednesday, April 9, before C. J. Sturge, Esq. (Chairman), and Messrs. Whitwell and English, Henry Bellamy, licensed hawker, Padholme Road, Peterborough, was charged with having unlawfully sold, on March 25 last, at the parish of Werrington, to Alfred Wright, Assistant Secretary to the Chemists and Druggists' Trade Association of Great Britain, a certain poison, to wit, laudanum (the same being a preparation of opium), and not labelled with the name and address of the seller of the same, in contravention of the Pharmacy Act, 1868.

Mr. Henry Glaisyer, Solicitor to the Association, Birmingham, conducted the prosecution, and Mr. J. A. Percival, Peterborough, appeared for the defence.

Mr. Glaisyer, in opening the case, explained that there was a large amount of illegal trading being carried on, and that in the interest of the public as well as the trade the Association was doing its utmost to suppress this breaking of the law. He went on to state that defendant travelled about the country selling drugs, and that on the day in question Mr. Alfred Wright visited Werrington, a village about four miles from Peterborough, where he met defendant with his van, which was fitted up as a chemist's shop, hawking drugs from house to house. He (Mr. Wright) purchased, amongst other articles, some laudanum, which was a preparation of opium, and came within the Act relating to poisons. It might be contended that the defendant was employed by a properly qualified chemist, but he called the attention of the Bench to the fact that it was the seller, *i.e.*, the one who regulated and controlled the sales, who was liable. In this case such a person was Bellamy.

Mr. Alfred Wright said he was Assistant-Secretary to the Association, and resided in Birmingham. On the 25th of March last he went to the village of Werrington, about four miles from Peterborough, and purchased from the defendant, who was travelling with a van fitted up as a chemist's shop, half an ounce of laudanum. The bottl

was labelled—"Laudannm—'Poison'—Arthur Carlton, Dispensing Chemist, 18, Long Causeway, Peterborough." He had analysed the poison in question, and found it to be a preparation of opium. The name of the defendant was on the van, and it was he who personally supplied him with the poison.

The Chairman: If it had been sold at Mr. Carlton's shop it would have been all right?

Witness: Yes.

In cross-examination witness stated that the name of A. Carlton, Chemist and Druggist, Peterborough, also apppeared upon the van.

Mr. J. A. Percival, for the defence, contended that the sale by defendant was on the same level as any sale by an apprentice or any other person in Mr. Carlton's legitimate employment, and that there was nothing in the Act which enforced defendant to sell in the shop only and not outside.

Mr. Arthur Carlton said defendant was in his own employment and travelled for him, but was not a qualified chemist. The articles sold were labelled with his (witness's) name and address, and the drugs were made up in his shop.

In cross-examination by Mr. Glaisyer, witness said Bellamy had complete control of the business conducted by him, and received from him (witness) a fixed salary and commission on sales. Bellamy was not a qualified chemist and druggist.

Re-examined by Mr. Percival: Bellamy had been in witness's employment since 1882, and was previously a chemists' porter. He had also been three years in a surgery and four years with a chemist.

Mr. Glaisyer, in addressing the Bench, quoted in detail the case of Templeman *v.* Trafford, after which, at the request of the magistrates, handed them the report of the trial. He also called their attention to the fact that even if Mr. Carlton was the seller the Act required that the buyer and seller should be introduced to each other, which was impossible when the poison was being hawked four miles off.

The Bench retired to consider their decision, and, on returning into Court, the Chairman said that they had given the case careful consideration, because it was a very fine point. Following, however, the case of Templeman *v.* Trafford in the Law Courts Reports, they held that the defendant was the seller of the poisons. The Act was framed to protect people buying them, and, if a man went four miles away from the shop, strictly he was the seller under the Act and he must be convicted. At the same time he did not believe defendant intended breaking the law. The penalty would be the minimum of 6*s*.

Mr. Glaisyer applied for the costs of the Trade Association's witness.

Mr. Carlton said it was usual for the Association to pay their witnesses.

The Chairman: Is that so?

Mr. Glaisyer answered that it was sometimes so.

Mr. Carlton: It should certainly be so in this case, especially as I am one of the members of the Society.

The ordinary Court costs only were added to the penalty.

Review.

Medical Guide to Contrexéville. (Vosges). By Dr. Debout D'Estrées, Médecin Inspecteur des Eaux. J. and A. Churchill. London.

This little book, which is dedicated to Doctor Garrod, is a translation of the author's French manual adapted to English readers. Contrexéville is a village which once formed part of the kingdom of Lorraine, and which now belongs to the department des Vosges, and to the district of Mirecourt. The soil is essentially calcareous; and it contains certain mineral springs which it is the object of the writer to bring prominently into notice and to introduce to the British public.

More than a century ago the place was visited by patients suffering from gravel and diseases of the bladder; and also by those afflicted with gout and disorders of the liver.

Of late great improvements have been effected; a bath establishment has been erected; a "pavilion" has been built; and the visitor in search of health will find all the accessories which are so liberally provided in similar continental resorts.

There are six springs which have been carefully *captured* (that is rendered available for treatment), of which the chief one, the Source de Pavillon, is under Government protection. A spring called la Souveraine does not seem to be in favour, its recomendation being free access to the fountain and the low price of the bottled water. Analysis determines the springs to be of a calcareous alkaline nature, of moderate strength, lithium being present; whilst iron with a trace of arsenic appears in the sediment of the *sources* specially recommended. The Source du Prince has long enjoyed a local reputation in chronic affections of the eye.

Owing to their chemical composition the use of the waters of Contrexéville is clearly indicated for gout. Alkalines (says Professor Charcot), and above all lithium, administered in small well diluted doses, have a remarkable effect on gout. They delay the paroxysms; they sometimes dissolve and reduce the deposits already formed and give more flexibility to the joints. Such results are claimed by Dr. D'Estrées for his favourite springs, and the diluted manner in which the alkaline salts are exhibited is advanced as the explanation of their success when the stronger waters of Carlsbad or Vichy have failed.

Reasoning from the teachings of analysis he proceeds to show their beneficial action in cases of gravel, stone, vesical catarrh, diseases of the prostate, infantile incontinence of urine, and hepatic colic; and he extends their application to the treatment of diabetes. Poor Madame de Sévigné, when she went to Vichy, was bled and purged on her arrival, and began the first day of her cure by swallowing twelve glasses of the water from the spring of the Grande Grille. Such heroic practices have disappeared from Vichy and elsewhere; thirty glasses are no longer taken in a day, and in this anæmic age a little more blood in the system is rather wanted than its abstraction.

It is a subject of regret to Dr. D'Estrées that the late Emperor Napoleon III. did not carry out his intention in 1866 of visiting these healing springs.

Of Contrexéville it has been said by another writer, that it is the annual rendezvous of the cleverest men, the wittiest talkers, and the most noted *gourmets* that one common malady can assemble. Its therapeutic advantages are warmly advocated in this Guide, which is free from that style of direct advertisement too common in publications of this nature.

Obituary.

Notice has been received of the death of the following:—

On the 24th of February, Mr. Richard Clay, Chemist and Druggist, Market Place, Cromford. Aged 70 years.

On the 25th of February, Mr. Hugh Cowan, Chemist and Druggist, High Street, Thurso. Aged 69 years.

On the 26th of February, Mr. William Cartwright, Chemist and Druggist, Hessle Road, Hull. Aged 44 years.

On the 7th of March, Mr. John Copeland, Chemist and Druggist, Cleveland, Somerset. Aged 56 years.

On the 7th of March, Mr. Joshua Laverty, Chemist and Druggist, New North Road, London. Aged 34 years.

On the 8th of March, Mr. Thomas Parnell, Chemist and Druggist, Oakham. Aged 60 years.

On the 16th of March, Mr. John Tily, Chemist and Druggist, Sevenoaks. Aged 68 years.

On the 21st of March, Mr. Robert Falconer, Chemist and Druggist, Nairn. Aged 60 years.

On the 21st of March, Mr. Fawcett Bowerbanks, Chemist and Druggist, Market Street, Cockermouth. Aged 58 years.

On the 21st of March, Mr. Walter Charles Bucknoll, Chemist and Druggist, Malden Road, Kentish Town. Aged 69 years.

On the 24th of March, Mr. Frank William Steel, Pharmaceutical Chemist, Fish Street Hill, London. Aged 37 years.

On the 24th of March, Mr. James Wood, Chemist and Druggist, Stonehaven, Kincardineshire. Aged 65 years.

On the 29th of March, Mr. William Frederick Blake, Pharmaceutical Chemist, High Street, Stroud, Gloucestershire. Aged 65 years. Mr. Blake had been a Member of the Pharmaceutical Society since 1856, and for many years held the office of Local Secretary.

On the 4th of April, Mr. Samuel Hunt, Chemist and Druggist, Market Hill, Sudbury. Aged 41 years. Mr. Hunt had been a Member of the Pharmaceutical Society since 1871.

On the 5th of April, Mr. Benjamin Johnson, Chemist and Druggist, Arkwright Street, Nottingham. Aged 45 years.

On the 7th of April, Mr. William Martin, Chemist and Druggist, Market Harborough. Aged 42 years. Mr. Martin had been a Member of the Pharmaceutical Society since 1869.

BOOKS RECEIVED.

On the Formation of Uric Acid in Animals: its Relation to Gout and Gravel. By P. W. Latham, M.A., M.D. Cambridge: Deighton, Bell and Co. 1884. From the Author.

Experimental Chemistry for Junior Students. By J. Emerson Reynolds, M.D., F.R.S. Part III. Metals and Allied Bodies. London: Longmans, Green and Co. 1884. From the Publishers.

Numerical Exercises in Chemistry. By T. Hands, M.A., F.R.A.S. London: Sampson Low and Co. 1884. From the Author.

The Cinchona Barks Pharmacognostically Considered. By Professor Flückiger, Translated with some additional Notes, by Fred. A. Power. London: J. and A. Churchill. 1884. From the Publishers.

A Treatise on Chemistry. By H. E. Roscoe, F.R.S., and C. Schorlemmer, F.R.S., Vol. III. The Chemistry of the Hydrocarbons and their Derivatives, or Organic Chemistry, Part II. London: Macmillan and Co., 1884. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Standard Galenical Preparations.

Sir,—The paper on "Extract of Nux Vomica," by Mr. Schacht, which is printed in your last issue, seeks to maintain certain opinions that call for some reply from me. First, let me thank Mr. Schacht for the manner in which he has expressed his dissent from certain propositions that I have advanced, and let me hope that in the remarks I am about to make there may be found that same spirit of courteous criticism which pervades all that Mr. Schacht has said on the other side.

The main point in the paper referred to resides in the apparently decided opinion that Mr. Schacht holds upon the general question of standard galenical preparations, the official recognition of which I have advocated, and in the special case of nux vomica Mr. Short and I have proved the feasibility of producing. We have defined a standard preparation of nux vomica as a preparation that "contains a definite and constant quantity of total alkaloid." The first objection supposed by Mr. Schacht to obtain against the adoption of this definition is stated in the following words:—"There is no doubt that a large portion of the medical activity of the drug does depend upon the alkaloids it contains, but I am acquainted with no proof that all the rest is inert." This sentence will pass very well for a paraphrase of a passage in the paper upon "Tincture of Nux Vomica," which I contributed, in conjunction with Mr. Short, to the Southport meeting of the Pharmaceutical Conference:—"It will be at once conceded that the important feature in a typical tincture of nux vomica is, or should be, uniformity in alkaloidal strength: the other constituents, though doubtless valuable, are of secondary importance." That is to say, the other constituents, principally fixed oil and fat, are not potent poisons, an increase in the dose of which to the extent of a grain or two would lead to fatal results. The next objection Mr. Schacht raises is that "if we are to standardize at all, we should standardize each potential element by itself and not a mixture of elements, one of which is of undetermined power." Theoretically this will be at once admitted, but, practically, I ask who has yet determined the quantitative relation of strychnine to brucine that is therapeutically the most active? We know that strychnine is a most potent toxic agent; the exact physiological action of brucine we are as yet unacquainted with, but we do know that, as an alkaloid, it is much less toxic than strychnine is. Having in view the production of a preparation of nux vomica that shall be, as far as possible and feasible, constant in therapeutic action, two courses are open to us. First, to make the proportion of the strychnine alone constant, and, second, to make the proportion of total alkaloid constant. The first course, besides being at the present time impracticable, would lead us to disregard the physiological activity of brucine, including its possible effect upon the action of strychnine. The alternative remains and strongly recommends itself, namely, to render the entire quantity of alkaloidal constituents constant and definite. Mr. Schacht urges against this, that the proportion of strychnine to brucine in the total alkaloid is naturally subject to variation, and he exhibits a table of results, under the impression that they lend support to this objection. But I would point out to Mr. Schacht that the table which he reproduces from a paper on "Extract of Nux Vomica," by Mr. Short and myself, is a table of analyses showing the proportion of strychnine and brucine in commercial extracts of nux vomica, no two of which have probably been prepared by precisely the same process. In fact, I have since learnt that in reference to four of them this is actually the case, and in one instance an entirely different solvent was used for extracting the nux vomica. To prove the statement that the proportion of strychnine to brucine in nux vomica is inconstant, a statement which at present we can neither affirm nor deny, it is necessary to make a series of analyses of the original seeds, which has not yet been done, but I hope soon will be by Mr. Short and myself. Even when this has been settled it will no doubt still be considered for many reasons preferable to make the standard "total alkaloid." I regret to notice from Mr. Schacht's concluding passages in reference to the "15 per cent. standard" that he yet fails to see the point of my remarks which were made in reply to the self-same objections at the Evening Meeting of the Pharmaceutical Society in February last, but as these have been fully reported in your Journal of February 9, I shall not reiterate them now. I would only remark that since this time the processes which Mr. Short and I have proposed for the preparation of standard galenical preparations of nux vomica have been tried by many pharmacists, both wholesale and retail, and have been found to be practicable and successful on the small and large scale. "If a sample comes out below the standard" it must assuredly be rejected for medical use; but such a result could only ensue when the details of the process were not faithfully adhered to. So far I have heard no valid objections to the official recognition of standard galenical preparations, while the position of the question has been greatly strengthened

by the adhesion, among others, of so eminent a scientific pharmacist as Professor Redwood, who has not only advocated, but also devised a process for the preparation of a standard liquid extract of cinchona.

The production of standard galenical preparations of potent drugs, which, in the majority of cases, needs the expenditure of a vast amount of preliminary scientific work, marks out a distinct line of progress and research in the pharmacy of the future—I mean, I think so.

WYNDHAM R. DUNSTAN.

ESTIMATION OF TOTAL ALKALOIDS IN EXTRACT OF NUX VOMICA.

Sir,—Mr. G. F. Schacht, in a paper published last week, describes a modification of Dragendorff's indirect process for estimating a mixture of strychnia and brucia.

Mr. Schacht prepares a volumetric test solution of potassio-mercuric iodide of such a strength that (to quote his own words) "each c.c. of this solution precipitates 0·00184 gram of mixed strychnia and brucia."

There are no details given in illustration as to how this constant factor (0·00184) is obtained in operating on a solution containing a mixture of strychnia and brucia in unknown proportions. Perhaps Mr. Schacht will record the details, as his process (if found reliable) appears more convenient than the quantitative method of Messrs. Dunstan and Short.

A careful manipulator, able to work out an algebraic simultaneous simple equation, should find no great difficulty in Dragendorff's process as detailed in his 'Plant Analysis,' the chief source of error being the rather uncertain composition of the precipitate.

8, *Torrington Place, W.C.* GEORGE SMITH.

SPIRIT OF NITROUS ETHER.

Sir,—Some months since, in commenting upon the proceedings of the Pharmaceutical Conference, you mentioned (referring to a paper of mine) the "interminable subject of sweet spirit of nitre."

Upon opening the Journal for April 12, and seeing two prominent articles upon this subject, I naturally thought that now, at least, the question was to be finally settled. Perhaps it was my own fault, due to too great expectation induced by the source of these papers, that I was disappointed, but such, I am sorry to say, was the case.

Of the first paper, viz., the one by Mr. MacEwan, I have only two remarks to make; the first is that the figures given under the head of "Diminution of Separation Volume" seem very instructive, because, if correct (which I have no reason to doubt), they show that the details of the manufacture are of the utmost importance.

During winter, Mr. MacEwan has found a greater loss of "ethereal liquid" in two months than was sustained by the samples shown by me in Southport in seven months, chiefly summer.

Moreover, these samples, now nearly fourteen months old, I find to separate nothing appreciable less than they did then.

They have, however, not been unstoppered since that time as far as I am aware. The second point is Mr. MacEwan's method of estimating the acidity, which I believe to be incapable of accurate results, as decinormal soda solution immediately decomposes sweet spirit of nitre; indeed, any alkali does so more or less rapidly.

Mr. Dott states that I consider aldehyde to be the active ingredient, and this I must most positively contradict. I said that I considered we had as much right to impute the activity to aldehyde as to nitrous ether, and gave my reasons for believing that Mr. Rimmington's argument in favour of the notion that nitrous ether produced the effects noticed, would apply with equal, if not greater, force to aldehyde. I never, however, stated or believed that aldehyde was the active principle, although I do now believe the activity is probably due to some polymeric form of aldehyde, such as paraldehyde or some nitro compound of it.

Mr. Dott's comparison between the action of aldehyde forming acetic acid in the blood, and vinegar in the stomach,—rather a stretch,—is unfortunate in the face of the fact that acetic acid or combinations containing it (such as oxymel simplex, oxymel scillæ, etc.) are constantly used in similar cases as sp. æth. nit., and not unfrequently in conjunction with it. Christison gives, amongst other actions of actic acid, the following:—stimulant, diaphoretic, and diuretic.

The same actions are imputed by the same author to sp. æther. nit., with the single addition of antispasmodic.

The medical authority quoted by Mr. Dott does not seem to have investigated the subject himself, and his views are similar to those taught forty years ago, and more or less accepted since, for the simple reason that no better theory has been advanced. The best proof, however, of their not being true is the fact that the sp. ætheris nitrosi of the Edinburgh Pharmacopœia, which, no doubt, contained, to say the least, a much larger proportion of the nitrous ether than any other, has not remained in demand and was, indeed, recommended by Christison forty years ago in the same dose as now employed with the present article.

That a nitro compound such as nitro-glycerine should decompose into a nitrite (and something else) in the blood is not surprising; but, I would ask, is diuresis the most marked result of the action of nitro-glycerine in the system?

I am very sorry that Mr. Dott has not been more successful with the hydric sulphide process, which is the only one which has yet occurred to me as likely to estimate the nitrous ether and nothing else; but he perhaps gave it up because it did not "go as it ought," or in other words, the spirit did not contain what it was expected to do.

With regard to the process finally adopted by Mr. Dott for the estimation of nitrous ether, he will find that I suggested at Southport (*Ph. J.*, Nov. 17, 1883, p. 392) practically the same thing; but I omitted the acid as unnecessary, because the preparation contains something (not aldehyde, as that is not present in sufficient quantity) which so decomposes as to render the acid unnecessary.

This something, which Mr. Dott entirely ignores but which I believe to be more probably the chief ingredient wanted, is consequently so far estimated at the same time, by my method. I may say that at Southport I stated that the test I had suggested was only a comparative one, as with different proportions of water different results would be obtained, but that with the same quantities the results were constant. This remark was not in the paper and was not reported.

I have only, in conclusion, to hope that this subject may remain "interminable" until some satisfactory conclusion has been arrived at.

Liverpool. A. C. ABRAHAM.

PHARMACY AT THE ANTIPODES.

Sir,—As your correspondent "Inquirens" solicits information as to the prospects of pharmacists at the Antipodes, I will briefly lay before your readers my experience on the subject, gained during a travel which I took nearly two years ago through Victoria, New South Wales, Tasmania, and New Zealand.

Businesses in the large towns are conducted in much the same style as in England, and from what I was informed are rather more remunerative than here. Higher prices are charged for nearly all things, but expenses are heavier as drugs, chemicals, sundries, etc., have to be imported. There is a fair amount of trade to be done in the up-country townships, but it is of a mixed character and would require some previous special experience.

I should certainly advise any young pharmacist intending to settle in Australia or New Zealand to take an assistantship first and acquire a knowledge of the special requirements of the trade. I was informed that situations are easily obtainable by pharmacists possessing the Minor or Major qualification, and that the remuneration is very good.

173, *Marylebone Road, N.W.* A. P. LUFF.

F. T.—The term "patent medicine" is commonly applied to preparations that are liable to pay stamp duty, although they may not be the subject of a patent. The selling of such articles necessitates the taking out a "patent medicine licence."

Lex.—We have not made any such statement, but our opinion upon the subject will be found in the *Pharmaceutical Journal* for June 9, 1883, p. 1025.

G. W. H.—(1) The specimen sent is *Geranium molle*. (2) *Leontopodium alpinum* (Compositæ).

COMMUNICATIONS, LETTERS, etc., have been received from Dr. Hager, Messrs. Dott, Gorrie, Inquirer.

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"New York Medical Journal," *August* 1880,
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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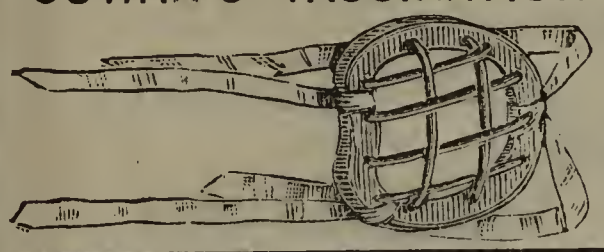

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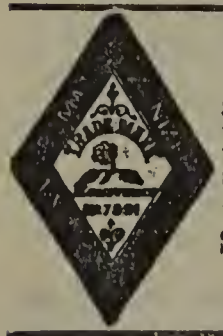

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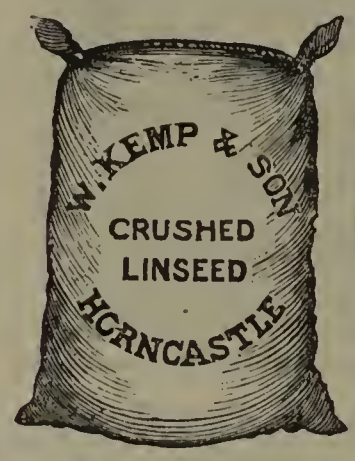

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AN energetic ASSISTANT, of good appearance. Also an IMPROVER. Preference for those that can Extract Teeth and give personal interview, otherwise forward photo, age, height, salary, in-doors, with whom and how long in last situation, to G. MORRIS, Chemist, Green Lanes, London, N.

BY May 18th.—A competent ASSISTANT, for a good class suburban Dispensing business, where one assistant only is employed. He must be of gentlemanly appearance and address and have had experience in a good house. Salary £50. Personal application or full particulars (with carte) to H. C. BIRCH, Upper Norwood, S.E.

ASSISTANTS WANTED.

AN ASSISTANT who has passed the Minor examination, with good Dispensing experience, and about 23 years of age. Salary £60. State fullest particulars of experience, age, height, and when disengaged. J. COLBY & Co., 101, Western Rd., Brighton.

AN ASSISTANT, about 22, in a light Retail and Dispensing business. Must be an accurate Dispenser and possess a good knowledge of the business generally, and active. Apply to W. ELLIOTT, 192, Uxbridge Rd., London, W.

DRUG Mills.—A man who has had experience in a Drug Mill and who is willing to make himself generally useful in a Laboratory. None need apply who have not been employed in a Drug Mill. Address, enclosing references and other particulars, A. B. C., care of Messrs. Horner & Son, Mitre Sq., Aldgate, London.

A SURGEON having a Retail is in want of a single, out-door, ASSISTANT, under 30 years of age. Apply at 31, Westburn Pl., Eaton Sq., before 11 o'clock, a.m.

NEAR town.—A steady, reliable, competent ASSISTANT, of good address and experience, with active, business habits. Capable of taking sole charge occasionally if required. Address, with full particulars of age, height and salary, to W. J., Messrs. Meggeson & Co., Miles Lane, Upper Thames St., London.

A JUNIOR ASSISTANT, of good address, for a first-class light Dispensing business. Apply to L. J. THOMPSON, 31, Coney St., York.

A COMPETENT ASSISTANT. Must be well up in Dispensing, a good counterman, have a good knowledge of a Mixed business, and be thoroughly well recommended. Senior, apprentice, &c., kept. Churchman preferred. Send carte if convenient, which will be returned. State age, salary and full particulars. THOMAS SELLORS, Coventry.

SENIOR ASSISTANT, in-door, for Retail and Dispensing business, in middle and working class neighbourhood. Warehouseman and apprentice kept. Must be capable of taking charge when required. References from two or three last engagements. Address, stating salary required, age, &c., to P. JEFFERSON, Pharmaceutical Chemist, Meadow Lane, Leeds.

AN active JUNIOR. In-door. Must write a good hand. FRANCIS H. NEWTH, 117, Uxbridge Rd., Shepherd's Bush, London, W.

DISPENSER.—A Member or Associate of the Pharmaceutical Society, possessing a knowledge of Homœopathic Pharmacy. Salary £100 a year, out-door. Apply by letter to HARRIS & GOLDSBROUGH, Surgeons, 149, Cold Harbour Lane, S.E.

BUSINESSES FOR DISPOSAL.

CHEMIST and Herbalist, Prescribing and Retail BUSINESS. Kent. £160, including stock, fixtures and household furniture. Good house. Rent low. Market town. Has done £6 a week. Splendid chance for beginner. Good reasons for leaving. By letter, DELTA, Gabriel & Troke, 82, City Rd., London.

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TO BE LET.

DOUGLAS, Isle of Man.—A rare opportunity to Chemists and Druggists, or others requiring good business premises.—To be let, that well known SHOP, Dwelling House, &c., 78, Strand St., Douglas, Isle of Man, occupied for many years by Mr. T. S. Greensill, Chemist and Druggist, and manufacturer of the far famed Mona Bouquet, &c. The above named premises contain large shop, drawing and sitting rooms (with private entrance from main street) several good bedrooms, attics, cellars, large yard, and out-houses, with entrance to same from back lane. In fact, the above named property, being situated in one of the best business thoroughfares in Douglas, is well worthy the attention of all requiring conveniences for carrying on an extensive trade, combined with good dwelling house. Rent £55 per annum. Possession to be had on the 12th May. A lease granted to a respectable tenant, if required. Apply to the owner, Mr. JOHN WOODRUFF, Old Strand Inn, Douglas, Isle of Man.

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50 DOZEN Shop Rounds, 7s. dozen ; blue and white Ointment Jars and Pots, Specie Jars, Jujube Jars, and other fancy jars ; a 3 and 5 grain Pill Machine, reversible, 25s. ; several 24-3 and 5 grain Pill Machines, equal to new, 16s. each ; outside Globe Lamp ; Sponge Cases, A 41, A 42 ; a 12ft. Fixture, as Maw's fig. A 84 ; 2ft. long, 4ft. long, 6ft. long, 8ft. long, 10ft. long, 12ft. long mahogany fronted Drawers, glass knobs and glass labels (bevelled edge), with lockers for bottles under ; 4ft. high, s. per foot run, inclusive of mahogany top to drawers. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

A SPLENDID plate glass Wall Case, as Maw's fig. A 88, 8ft. long, £28 ; 20ft., 18ft., 14ft., 8ft., 7ft., 6ft.' 5ft. mahogany top Counters, fitted with drawers ; 12ft. mahogany fronted Counter ; 6ft. mahogany fronted Counter ; 13ft. 6in. mahogany and plate glass case fronted Counter ; 7ft. do., do. ; a 16ft. long, 3ft. wide, Side Counter, fitted with drawers ; a quantity of Shelving, Cupboard Doors, &c. E. NATALI, 207, Old Street, near Pitfield St., London, E.C.

DISPENSING Screen, 5ft. 6in., with counter under, fitted with drawers and plate glass cases in front, £13, a bargain ; Dispensing Screens, 5ft., 6ft., 7ft., glass case at each side, with silvered plate-glass centre, with marble slab in front, with carved wood on top, 3ft. high, the cases at each side plate-glass doors, with tablets on top, inside case fitted with silvered glass and shifting shelves, £7 10s. ; as fig A 53, 5ft. 6in. long. 8ft. long, 7ft. 6in. long ; as fig. A 54, 4ft. long ; as fig. A 55, 5ft. long, 6ft. long, 7ft. 6in. long ; Sponge Case, A 43 ; a Centre Case, 8ft. long, 5ft. wide, mahogany, £10, worth double ; a number of other size Screens and Cases, very cheap. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

PLATE glass Counter Cases, as fig. A 1, 5ft. long ; A 2, 3ft. long, 4ft. long, 4ft. 6in. long ; as fig. A 3, 3ft. long, 3ft. 6in. long ; A 6, 4ft. long, 5ft. long, 6ft. long ; as fig. A 7, 3ft. 6in. long, 6ft. long ; as fig A 8, 5ft. long, 6ft. long ; as fig. A 13, 4ft. long, 4ft. 6in. long ; as fig. A 15, 6ft. 6in. long, 7ft., 8ft., and 9ft. long ; A 16, 3ft. long, 3ft. 6in., and 4ft. long ; A 17, 4ft. and 4ft. 6in. long ; A 18, 5ft., 6ft., 7ft. 6in. long, and 9ft. long ; Tooth Brush Cases, A 9, A 10, revolving front ; Desk and Cases, fig. A 30, 2ft. 6in. long, and 3ft. long, as fig A 31 ; Cigar Cases, A 34. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

International Health Exhibition,

LONDON, 1884.

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PRESIDENT.

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HEALTH—FOOD, DRESS, THE DWELLING, THE SCHOOL, AND THE WORKSHOP.

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All information can be obtained on application to the Secretary, South Kensington, London, S.W. The Catalogue, Guide, and other official publications will be issued by William Clowes & Sons, Limited, to whom all applications for advertisements in these publications should be made. None but official publications and publications officially sanctioned will be ALLOWED to be SOLD in the EXHIBITION.

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TO CHEMISTS, DRUGGISTS & OTHERS.

MESSRS. DRIVER & PERFECT will Sell by Auction, at their spacious Rooms, 8, Seven Sisters Rd., Holloway, on Wednesday, May 7, at 1 o'clock, a large stock of Drugs and Sundries, comprising 1½ ton Citrate Magnesia, 500 gallons Cod Liver Oil, 800 quarts Tasteless Castor Oil, ½ ton of Camphor, 5 cwt. Chemical Food, quantity Essence Lemon, 150 gallons genuine Vinegar, Scammony Virgin, Gum Sandarac, Cort. Cinchon., Rad. Ipecac., Emplast. Plumbi, Honeycomb Sponges, Ice Machine, and numerous effects. Catalogues on application to the Auctioneers as above. N.B.—A few good lots of Drugs, Fixtures, &c., can be included, and early application should be made.

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Terms for valuation on application.

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Double „ „ „ 34s. „

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MADE FROM THE FINEST FELT.

No.	1	2	3	4	5
Single ... ... per dozen,	7/6	9/6	11/6	14/-	20/-
Double ... ... „	17/-	22/6	28/-	34/-	45/
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Children's Single, per dozen, 5/-; Double, 13/-

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For the Stomach and Feet, very superior to the old Tin or Earthenware articles.

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Plain	4/-	5/9	6/3	8/- each.
Covered in imitation sealskin	5/9	7/9	8/6	11/- „

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	8/-	14/-	21/-	21/-	30/-	30/-	42/-	42/-	50/-	72/-

BAILEY'S One Guinea Case of Respirators

In Glass Lid Box. The cheapest and best assortment, contains—

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One Guinea, Box included.
Usual Price without Box, 23s. 5d.

May be obtained of all Wholesale Drug Houses and Patent Medicine Vendors throughout the World. Show cards and illustrated price list free.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 723.] SATURDAY, MAY 3, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-third Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 21st day of May, 1884, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

BENEVOLENT FUND.

For the Relief of Distressed Members or Associates of the Society of Pharmaceutical Chemists, and Chemists and Druggists, and their Widows and Orphans.

There are at present *thirty-nine* annuitants, receiving £1320 per annum, and casual relief is also granted, amounting to nearly £700 per annum, involving a total annual expenditure of upwards of £2000.

The following is the scale of pensions:—

£30 per annum to pensioners under 65 years of age, and

£35 per annum to pensioners 65 years of age and upwards.

THE JACOB BELL MEMORIAL SCHOLARSHIPS.*

TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the Lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships take place on the second Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

THE SCHOOL OF PHARMACY

OF THE

Pharmaceutical Society of Great Britain.

FORTY-SECOND SESSION, 1883-84.

SYSTEMATIC AND PRACTICAL BOTANY.

The Summer Course on Systematic and Practical Botany commences this (Saturday) Morning, May 3rd, at 8 o'clock, in the Gardens of the Royal Botanic Society, Regent's Park, and will be continued on the succeeding Friday and Saturday Mornings, at the same hour, until the end of July.

Application for admission to the School, for Prospectuses, or for further information, may be made to the Professors or to their Assistants in the Lecture Theatre, or Laboratories, 17, Bloomsbury Square, London, W.C.

THE THIRTEENTH ANNUAL DINNER

OF THE

Members of the Pharmaceutical Society

AND THEIR FRIENDS

WILL TAKE PLACE AT THE HOLBORN RESTAURANT,

On TUESDAY, MAY 20th, 1884, at Half-past Six o'clock.

THE PRESIDENT IN THE CHAIR.

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THE VICE-PRESIDENT.	ISAIAH BOURDAS.	WALTER HILLS.
THE TREASURER.	E. NORTHWAY BUTT.	DR. PAUL.
PROFESSOR ATTFIELD.		

Honorary Secretary, RICHARD BREMRIDGE.

Tickets, One Guinea each (including Wine) can only be obtained from the Honorary Secretary, RICHARD BREMRIDGE, 17, Bloomsbury Square.

NOTICE TO ADVERTISERS.

THE PHARMACEUTICAL JOURNAL of MAY 24 will contain—

The Report of the Annual Meeting of the Society.
The Result of the Election to the Council.
Notices of the Annual Dinner, Conversazione, &c.
The Report of the Annual Meeting of the Chemists' and Druggists' Trade Association.

Advertisements for this important Number should be forwarded without delay. No extra charge, the terms being the same as for ordinary issues, viz., Whole Page, £4 4*s.*; Half Page or Whole Column, £2 2*s.*; Quarter Page or Half Column, £1 1*s.*; Eighth Page or Quarter Column, 10*s.* 6*d.*

Further particulars may be had on application to the Publishers,
J. & A. CHURCHILL, 11, New Burlington Street, LONDON, W.

Thirteenth Edition.

SQUIRE'S COMPANION TO THE BRITISH PHARMACOPŒIA

London: J. & A. CHURCHILL, 11, New Burlington Street.

To the Members of the Pharmaceutical Society.

Having been again nominated as a Candidate at the approaching Election for the Council of our Society, wish to indicate in a few words the grounds upon which my acceptance of the nomination are based, and more particularly with regard to the principal questions which are just now of vital interest to us.

In soliciting the support of all those who may find their views to be more nearly in accordance with my own, I would assure them that it will be my honest endeavour to deserve their help by diligent interest in and steady support of those principles which are calculated to be the best for the future welfare of Chemists as a whole.

It is a cause for great regret that the Society does not enjoy the popularity and consideration which might fairly be claimed by its inherent importance, neither on the other hand does it receive the general support that should be accorded it. I should therefore cordially agree with and advise any means whereby the hands of the Council would be strengthened for the benefit of the Members of the Society, both in the Educational and Professional relations of their career, besides assisting them by a watchful interest of their rights as defined by the Pharmacy Act.

As one of the younger branch of Pharmacists who for the last few years have been gaining experience in the peculiar requirements of the day, and upon whom the future of Pharmacy must depend, it appears to me advisable that such section of our body should be represented at the Council Board.

It will be necessary for the new Council to consider afresh the clauses of the Pharmacy Act Amendment Bill, recently rejected by the Government, and more especially those affecting the questions of Education and Examination.

I am not in favour of the scheme as drafted in the present Bill, but should support one which would in my opinion more generally meet the wishes and needs of the whole of our profession, and not a minority.

Briefly then, the dual system of qualification I do not think it necessary or advisable to maintain in its present state, but by altering the character of the Minor Examination, and regarding it, in the new form, as a test by which the Student can qualify as an Assistant, the ground would be cleared for a satisfactory curriculum, for a period very little, if any, longer than the average time now passed by the Students at the Pharmacy Schools. The Major would then remain the only examination qualifying one for business with the title of Pharmaceutical Chemist.

With regard to the Poison Regulations, I consider the interests of the public would be best served if medicine of all kinds, whether Patent or Proprietary, if containing Poisons, should be so declared, and come within the meaning of the Poisons Act, then to be vended only by those who have been declared qualified to deal with such remedies.

One will be better able, however, to consider the many bearings of the question now in detail, when the text of the promised Government Bill is issued.

In conclusion, I would take the opportunity of thanking all those who recorded their votes for me at the Election of 1882.

Faithfully yours,

CHAS. SHAPLEY.

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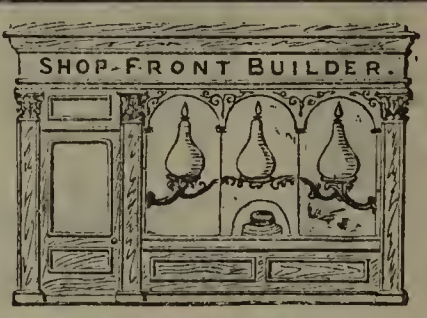

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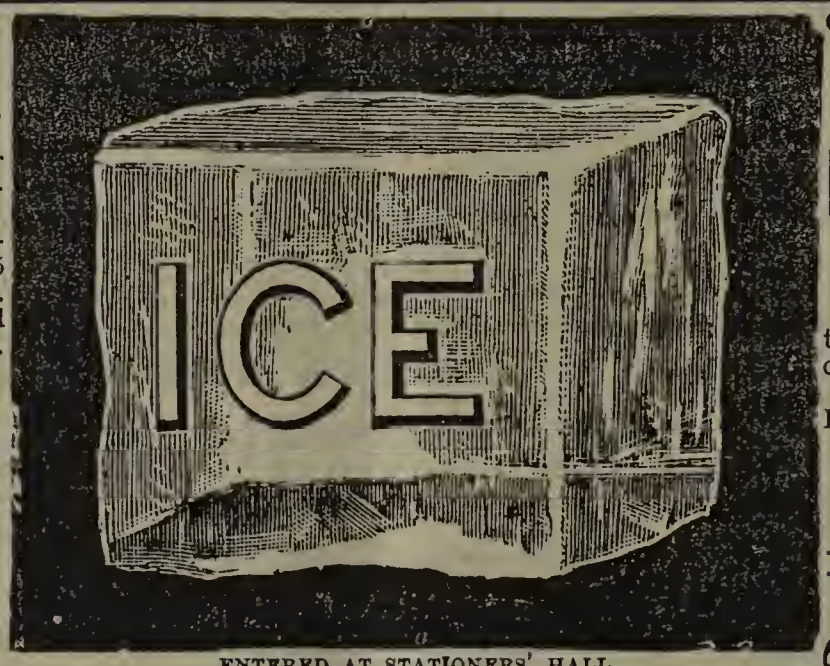

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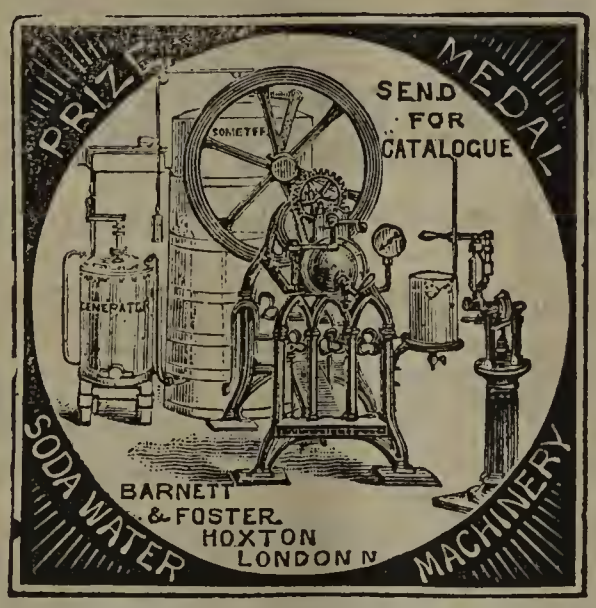

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DR. REDWOOD'S PROCESS FOR LIQUID EXTRACT OF CINCHONA.

BY A. J. COWNLEY.

The great difference between the opinions expressed in reference to the process suggested by Professor Redwood for the preparation of liquid extract of cinchona bark, in the course of the discussion that took place after the reading of his paper, is sufficient evidence that there is room for further investigation of the subject, and this view was indorsed by the impression entertained by one of the speakers, "that they knew very little about bark." In any case it appeared desirable to ascertain how far the process now suggested by Professor Redwood as a substitute for the one which is official in the present British Pharmacopœia is calculated to realize the objects which he has defined as being most important and whether it is a substantial improvement on the existing process. I have therefore carried out some experiments to determine these points, and have obtained results that I will now proceed to describe.

As regards the kind of cinchona bark operated upon, I have acted upon Professor Redwood's decision that East Indian succirubra bark is the best to be used for preparing a liquid extract, and though not fully agreeing with this opinion, have not now ventured to offer any objection to it, since I am not aware that the "previous observations"* which led Professor Redwood to that decision have yet been made public. Some difficulty was experienced, however, in selecting for the purpose of my experiments "red cinchona bark of good average quality." In the absence of any criterion to serve as a guide in this respect and having regard to the extreme variability of this kind of bark,—the contents of alkaloids ranging from less than one per cent. up to more than ten per cent.,—as well as the absence of any definite or recognizable relation between the external characters of a sample and the amount of alkaloids contained in it, I concluded that it would be best to operate upon bark of previously ascertained alkaloidal contents, and to choose such as contained a medium percentage, as shown by the following figures:—

	Per cent.		Grains per lb.
Quinine	2·1		147
Cinchonidine	1·6		112
Cinchonine	2·03	or	142¼
Amorphous alkaloid	1·00		70
Total alkaloids	6·73		471¼

Liquid extract made from this bark by a process capable of effecting the entire removal of the alkaloids, and standardized so that 1 fluid ounce would correspond to 1 ounce of the bark, ought, therefore, in accordance with the above figures, to contain about 29½ grains of total alkaloid per fluid ounce, with the several alkaloids in the following proportions:—

	Grains.
Quinine	9·2
Cinchonidine	7·0
Cinchonine	8·9
Amorphous alkaloids	4·4
Total alkaloids	29·5

This would be rather more than 5 per cent.—the proportion recommended by Professor Redwood; but for the purpose in view the bark was considered to be sufficiently near to the proper standard.

In operating upon one pound of this bark in the manner directed, I found that when 10 pints of liquid had passed through, the percolate still gave a precipitate when mixed with caustic soda in excess; the operation was therefore continued until the percolate had ceased to give this reaction. On reaching that point 13¾ pints of liquid had passed through. This percolate was sensibly acid, even while thus dilute, and when evaporated down to one pint was much more strongly acid. On cooling and diluting the liquor with water it deposited some brown flocculent material, which, when separated by filtration, washed and dried, was found to weigh 27¼ grains and to contain 1·1 grain quinine with traces of the other alkaloids. The filtered liquid evaporated to dryness left a residue of solid extract weighing 4¼ ounces, which was found on analysis to contain 12·96 per cent. total alkaloid.*

According to the directions given by Professor Redwood in his paper for preparing the liquid extract from this solid extract, it is easy either to obtain a preparation that shall contain 5 per cent. total alkaloid, or one containing in a given bulk exactly as much total alkaloid as the corresponding weight of bark operated upon. But to fulfil both these conditions it would be necessary to use bark containing exactly 6·25 per cent. total alkaloids. In the present case, for instance, 1 ounce of the bark contained nearly 29½ grains of total alkaloids, and by dissolving to the volume of a fluid ounce as much extract as contained that quantity of total alkaloids (227½ grains), of course the fluid ounce of liquid extract would to that degree correspond to 1 ounce of the bark it was made from, and would contain 6·73 per cent. of total alkaloid. To bring it nearer to Professor Redwood's standard of 5 per cent., 168¾ grains of the dry solid extract was dissolved to the volume of one fluid ounce, and on analysis the product gave:—

	Grains.
Quinine	5·89
Cinchonidine	5·90
Cinchonine	5·69
Amorphous alkaloid	4·39
Total.	21·87 = 5 per cent.

* Clearly there is a growing "fashion" in favour of red bark. We may, however, take the opportunity here of remarking that among the various recommendations of Indian succirubra bark, the one put forward by Professor Bentley, of its being "the sole bark recognized in the German Pharmacopœia," seems to be scarcely in accordance with the qualifying term "*præcipue*," which is used in that work.—ED. PHARM. JOURN.

* I was unable to obtain satisfactory results in the analysis of this extract according to the method directed by Professor Redwood. On treating 20 grains of the extract with caustic soda, a slimy precipitate was thrown down, and the liquid became so thick that it could not be filtered readily. After washing and drying this precipitate, it weighed only 0·92 grain, though it was only in part alkaloid, while the quantity of alkaloid was found by another method to be 2·59 grains. Part of this deficiency was in all probability owing to the viscous state of the extract solution when mixed with caustic soda, but in part it was a consequence of the solvent action of the water present. This was ascertained by operating upon a quantity of dry quinine sulphate containing 2·59 grains of alkaloid dissolved in one fluid ounce of water, and mixed with three fluid drams soda liquor and washing the precipitate so obtained. The dried precipitate obtained weighed only 1·97 grain showing a loss of 0·62 grain.

By comparing these results with those furnished by the analysis of the bark operated upon, it will at once be seen that the relative proportions of the alkaloids are different as compared with the original bark, and that there is in the extract a relative deficiency of quinine, together with a relative preponderance of amorphous alkaloid. There was, therefore, some reason to infer that the extract did not adequately represent the bark from which it was made, inasmuch as it contained a smaller proportion of the most valuable and important alkaloid quinine, and a much larger relative proportion of the less valuable amorphous alkaloid, which is by some considered to be objectionable from a medicinal point of view. In addition it will be seen that the quantity of solid extract requisite to make one fluid ounce of liquid extract representing one ounce of the bark, was very much larger than the quantity obtained from one ounce of bark, or 227½ grains instead of 115½ grains.

This leads to a consideration of the further desideratum, that in preparing liquid extract "the bark should be exhausted of its alkaloids by the process adopted," and it must be pointed out that as yet no evidence has been furnished that the suggested process is capable of effecting such a result. The device just referred to, of taking as much solid extract as contains a desired quantity of total alkaloids in order to make a certain bulk of liquid extract, is one very safe to rely upon for standardizing the amount of total alkaloid in the latter preparation; but since it has no kind of connection with the entire removal of the alkaloids from the bark used, the efficacy of the process in this respect must be tested in another way. In order to obtain some evidence on this point the total quantities of the several alkaloids in the solid extract above referred to were computed on the basis of the analysis and compared with the quantities contained in the bark from which it was made, as follows:—

	One pound of bark contained Grains.	4¼ ozs. of solid extract contained Grains.	Deficiency.
Quinine	147	64·57	82·43
Cinchonidine . .	112	64·70	47·30
Cinchonine . . .	142¼	62·30	79·95
Amorphous alkaloid	70	48·03	21·97
	471·¼	239·60	231·65

It is evident from these figures that there was not only a large deficiency in the amount of total alkaloid, but that the quantities of the individual alkaloids showed dissimilar deficiencies, and that, in short, while only one-half of the total alkaloids had been extracted from the bark it was chiefly in regard to the more important alkaloids that this loss was most considerable. Evidently, therefore, the proposed treatment with hydrochloric acid does not furnish a preparation that can be considered to represent cinchona bark in such a manner that a fluid ounce shall contain all the valuable medicinal properties of an ounce of that drug.

In making liquid extract by this process the bark consumed is only half represented as regards total alkaloids, for, as already shown, it would be necessary to take the solid extract from nearly two ounces of bark to make one fluid ounce of liquid extract containing as much total alkaloid as one ounce of the bark, while beyond this the total alkaloid in the liquid extract so produced would be much inferior, as regards the relative proportions of its constituents, to that actually contained in the bark itself.

To obtain further confirmation of this result the residual bark was submitted to analysis, and it was found to contain 4·49 per cent. total alkaloid. The following table gives a general *résumé* of these results, from which it will be seen that the residual bark contained nearly as much alkaloid as had been extracted by the process and that as regards the relative proportion of quinine it contained it was even better than before treatment:—

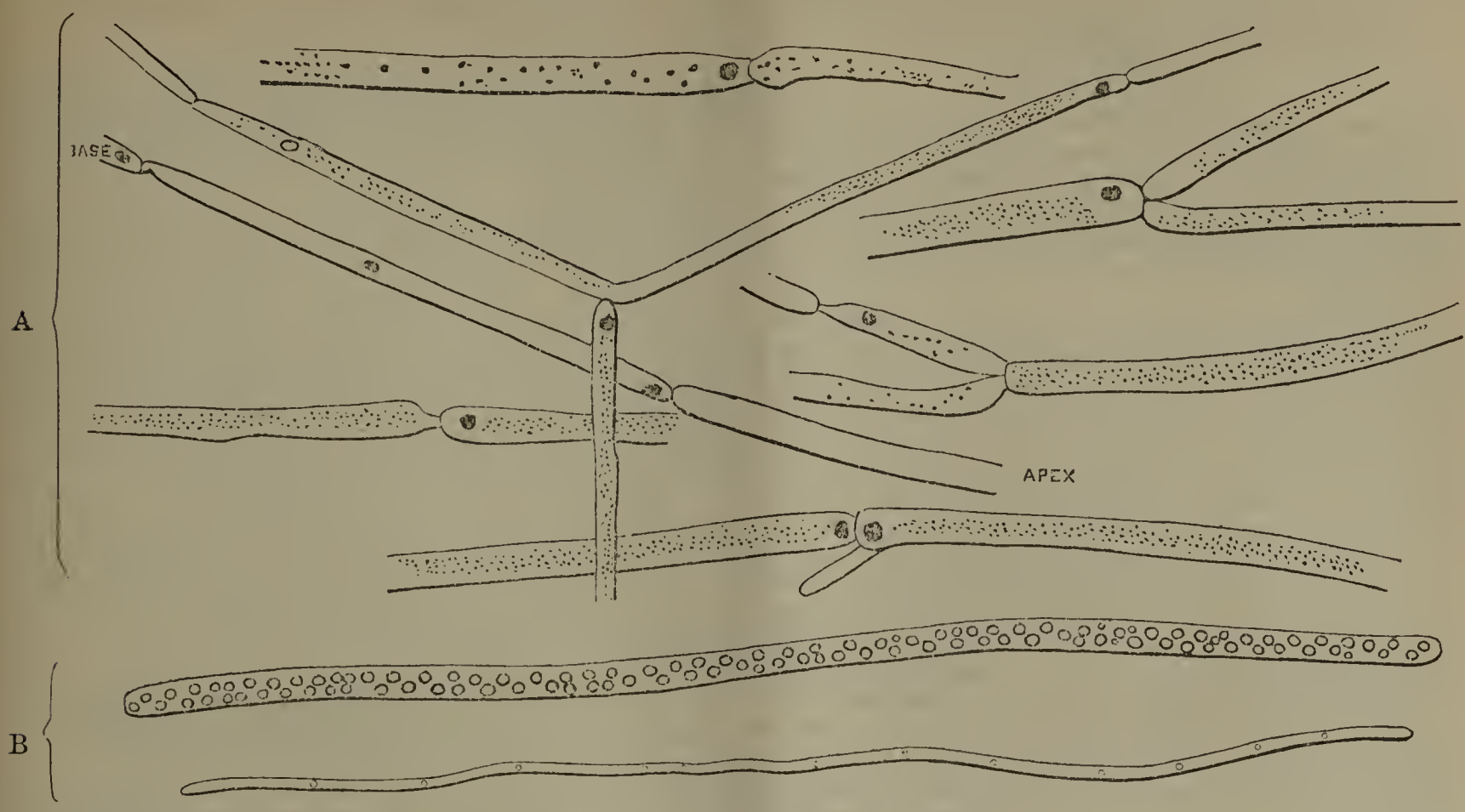
	One pound of the bark contained Grains.	Precipitated by water 27·3 grains. Grains.	Solid extract of red cinchona 4¼ ozs. Grains.	Residual bark contained Grains.
Quinine . . .	147	1·1	64·57	81·33
Cinchonidine .	112	—	64·70	47·30
Cinchonine . .	142·25	—	62·30	79·95
Amorphous alkaloid . . .	70	—	48·03	21·97
	471·25	1·1	239·60	230·55

BEGGIATOA ALBA: THE SO-CALLED "SEWAGE FUNGUS."

BY ALFRED W. BENNETT, M.A., B.Sc., F.L.S.,
Lecturer on Botany at St. Thomas's Hospital.

Under the name of "sewage-fungus," a peculiar organism is familiar to sanitary engineers as occurring abundantly and universally in the effluent water from sewage-works, forming dense flocculent greyish-white masses attached to the bottom and sides of the channel or to ordinary green algæ. Under the microscope it is seen to consist of an immense quantity of colourless threads, with but little or no chlorophyll, full of granular protoplasm, and containing a number of bright strongly refractive granular particles. This is *Beggiatoa alba*, Vauch., an interesting and remarkable organism.

The best description and drawing with which I am acquainted are by Zopf ('Die Spaltpilze,' Breslau, 1883, p. 76); but the specimens I have had an opportunity of examining differ somewhat from the typical form. Zopf describes the filaments as varying greatly in diameter, from 1 to 5 mm., as being unbranched and unseptated, and as characterized by the presence of strongly refractive globular particles, which have been determined by Professor Cohn of Breslau and Professor Cramer of Zürich to consist of pure sulphur. I find the filaments to be copiously branched, either dichotomously or laterally, and septated, either at the bases of the branches or elsewhere, and the cells to be frequently remarkably constricted above and below the septa. Still these low organisms are so often variable in points of structure of this kind, that further evidence of the constancy of these differences would be required before establishing a distinct species. The globules of sulphur I find most commonly situated one immediately below each septum; but sometimes towards the centre of a cell or more generally diffused. The systematic position of *Beggiatoa* is somewhat obscure. Zopf places it without hesitation in the Schizomycetes, with which it agrees in the absence of chlorophyll, and in a capacity for assuming different conditions, of which the ordinary form may be regarded as the leptothrix state. It also has corre-



A. *Beggiatoa alba* or sp. nov. observed in effluent from Sewage Works at Hertford.
B. *Beggiatoa alba*. From Zopf's figure in the 'Encyklopædie der Naturwissenschaften.' } Multiplied about 500 diams.

sponding bacillus, bacterium, coccus, and spirillum conditions. On the other hand it is certainly closely allied to the Oscillatorieæ through *Crenothrix*, if this genus is to be retained; and if at certain times of the year it develops chlorophyll, which I think is probably the case, there would be no good characters by which to distinguish it from that class. If the trifurcate division of Thallophytes, which is a modification of Sachs's, is adopted, into algæ, fungi, and protophytes, it will come under the third and lowest class.

The source of the sulphur contained in this organism is a very interesting question. It is a prevalent idea among sanitary engineers that the presence in water of the "sewage-fungus" is a sure indication of partially decomposed sewage. But this would seem to be not necessarily the case. Zopf describes it as occurring in the effluent water from manufactories, especially sugar factories and tanneries, and in thermal sulphur springs, as well as in drains. Luerssen ('Die Kryptogamen,' Leipzig, 1879, p. 24) gives as its habitat putrid water, noisome ditches, the effluents of manufactories, and mineral springs, especially all thermal sulphur springs, as those of the Alps and Pyrenees, Aix-la-Chapelle, baths at Vienna, etc. I have myself seen what I have no doubt to be *Beggiatoa alba* in large quantities on the waste ground about alkali works near Jarrow-on-Tyne. It therefore has probably the power of extracting the sulphur not only from decomposing organic matter, but also from mineral sulphates dissolved in the water; though the absence of chlorophyll would indicate that it is dependent on decaying organic substances for its carbon. Luerssen states that it has the power of developing sulphuretted hydrogen out of the sulphates in the water, and that water from thermal springs at Landeck containing this organism, preserved in a closed glass bottle for four months, contained from 5·07 to 7·24 cubic centimetres to the litre of sulphuretted hydrogen, as against 0·92 to 1·65 cubic centimetres per litre in the fresh water. But it is difficult to attribute this production of H_2S to the *Beggiatoa* in connection with the fact that it undoubtedly has the power of separating free sulphur. There can be no doubt that neutral sulphates are decomposed by organic matter in the water with separation of sulphuretted hydrogen or formation of sulphides; as is shown by the constant presence of protosulphide of iron in water containing decaying vegetable matter. But as sulphides contain a larger percentage of sulphur than sulphates, it is difficult to reconcile this process with the simultaneous elimination of free sulphur. Supposing that both sulphides and sulphites are found in the water, we might get free sulphur from the mutual decomposition of sulphurous acid and sulphuretted hydrogen, thus:—

$$2H_2S + SO_2 = 2H_2O + S_3.$$

In the locality where I had the opportunity of examining the *Beggiatoa* there is abundance of sulphates provided for its nutriment. The sewage of Hertford is carried into the river Lea after being treated by a modification of the process known as Anderson's, consisting essentially in precipitation by sulphate of alumina, lime, and protosulphate of iron; and it was from the open channel which conducts the water, after being so treated, into the Lea, that I obtained my specimens.

The growth of the so-called "sewage-fungus" must undoubtedly be regarded as evidence of the presence in the water of an abnormal amount of sulphates, derived either directly from sewage or from the substances used in precipitating it, or in other ways in manufactories. But there seems no reason to believe that it will itself have any injurious effect on the water. It is difficult to see how the sulphur, once set free, can again combine with hydrogen to form sulphuretted hydrogen as long as the organism is growing in the water. Indeed if allowed to accumulate, and periodically removed, it may tend to purify the water by abstracting from it some of the undue proportion of sulphur. Further examination of this interesting organism, and especially careful analyses of the ash, would be very desirable.

IMPROVEMENT IN THE EXTRACTION OF SULPHUR.*

BY CAMILLE VINCENT.

Sulphur is found in superficial deposits, resulting from volcanic eruptions, forming so-called "solfatares," or else in deep beds associated with marl, bituminous limestone, gypsum, celestine, etc., forming so-called "soufrières," which are the most important deposits of sulphur.

The principal "soufrières" are in Sicily and in continental Italy.

The ore is obtained in the simplest possible way, generally with a pick, and transported on the backs of the natives. The metallurgy of this ore consists in the partial combustion of the sulphur; the heat given off from the flame is sufficient to melt the entire mass and in this way the liquid sulphur is produced, which is then collected. In Sicily the sulphur is treated in a furnace to which the name of "calcarone" is given. This consists of an inclined circular bed, upon which the mineral is placed, and bounded by walls. The pile thus formed is covered with a sufficiently thick layer of the exhausted material in order to prevent the too active combination of the sulphur.

During the preparation of the pile, at suitable distances passages are left, in which fagots or bundles of wood are placed. The calcarone being thus prepared, the wood is lighted and the entrance of the air is so arranged as to prevent a too rapid increase of the combustion and a too great increase of temperature. After the operation has been continued for some time, the heap is cooled at certain points; then it is cooled at several other points until the fire is completely extinguished. By this process large quantities of sulphurous acid are produced, and especially is this the case when the wind influences the combustion and makes the cooking of the furnace difficult. This method of procedure is unhealthy and is productive of considerable damage by preventing all agricultural pursuits within a given radius, thus making it necessary to limit the length of time allowed for its production. It is, indeed, forbidden in Italy to burn the sulphur from the 1st of July to the 31st of December. The first six months of the year only are reserved for this work.

These calcaroni do not yield more than 50 and in certain cases 60 per cent., at most, of the amount of sulphur contained in the ore. The remainder serves as fuel and quantities of it pass off as sulphurous acid.

The crudeness of this process had for a long time been the cause of numerous researches, with a view of devising a method for the extraction of sulphur in a more rational and cheaper manner by employing some other fuel.

Attempts have been made by using hot air, by using steam under pressure, by superheated steam, and finally by the use of carbon disulphide for dissolving out the sulphur. All of these processes have had for their object the more rapid and complete extraction of the sulphur contained in the ore as well as to avoid the production of the sulphurous acid, and so to allow the continuance of the extraction during the entire year.

The first of these processes consists in filling chambers of masonry or kilns with the ore and in passing through the sulphur a current of hot gas, coming from a hearth fed by wood or by coal. In this way it is possible to prevent the formation of a considerable portion of the sulphurous acid, but the operation only takes place slowly and the heating of the mass is very irregular. A large amount of fuel is required; the manual labour is increased, so that the economy realized is of no importance.

The use of steam seemed at first to afford the best solution of the question, as the operation is very simple, very rapid, and the sulphur obtained is of the very best quality. The result is a product superior to that obtained with the "calcarone," and it does not produce any sulphurous acid.

But it has been found that these advantages were to a great extent counterbalanced by the expense of purchasing and preservation of the necessary materials used in conducting the process, as well as the large expense required for fuel.

The necessary plant consists of steam boilers and autoclaves for the receipt of the ore and other various accessories.

The water which is used for feeding the boilers is always bad and produces incrustations, so that this forms a serious objection to the use and to the taking care of this apparatus. Finally, the proportion of fuel is considerable, on account of the large consumption of steam required for the heating of the ore, and by the radiation of the apparatus where surfaces are exposed.

This process, therefore, is not applicable in all cases, as the results, although superior to those of the "calcaroni," are not commensurate to the expense required for the purchase of fuel, the increase of manual labour, the deterioration of the apparatus, and of the consequent diminution of the capital.

The treatment of the ore by carbon disulphide, although theoretically very rational, presents such objections when used that it may just as well be regarded as impracticable. We find this compound volatilizes so easily that its management becomes very difficult, and dangerous as well, and that the expenses of the process are largely increased. Besides, a particular article is essential, which is quite expensive of itself.

All these difficulties have prevented the different processes thus far described from coming into general use, as had been expected, and the sulphur is still almost entirely extracted by the fusion in the calcarone.

About 1805, M. Thomas made attempts to extract the sulphur from its ore by immersing the ore in saline solutions heated up to a convenient temperature. Later on, in 1867, Balard suggested the use, for the same purpose, of the mother-liquors of saline marshes, rich in magnesium chloride. Finally, in 1868, Deperars took out an Italian patent for the extraction of sulphur by immersing the mineral in a solution heated up to 10° or 20° above the freezing point of this body, thereby effecting the separation of the earthy material. The liquid curd was a solution of calcium chloride.

The apparatus which was patented consists of a spherical boiler or chamber of cast metal, capable of holding 2000 litres, having a discharge stop-cock, and above this is a vertical cylinder into which, by means of a crane, a perforated basket of sheet iron filled with the ore is lowered and allowed to rest on the grate.

The apparatus is fitted into a furnace, so that the boiler may be directly heated, while the cylindrical portion becomes surrounded with the heated gases as they pass on to the chimney. The basket, filled with the ore, lowered through the cylinder, becomes immersed in the solution of calcium chloride which is heated up to 130°. The sulphur melts and collects in the lower portion of the boiler, from which it is drawn off by the discharge-cock and received into moulds. When it is ascertained that the ore is freed from the sulphur, the basket is elevated by means of the crane and immediately lowered into a cylinder filled with water, heated in the centre of the furnace, in order to wash the residue, and thus to preserve the saline solution with which it has become covered. This water serves to counterbalance the evaporation in the extraction apparatus.

At this time it was difficult to obtain calcium chloride at reasonable prices at the locality where the sulphur was extracted. Besides, other difficulties followed in the carrying out of this process, so much so, that in 1867 the patent was abandoned and has since become public property. Quite recently this process has been taken up by De la Tour Dubrenil, and put into practice with considerable success.

* From the *Bulletin de la Société Chimique de Paris*, xl., 528. Reprinted from the *Oil, Paint and Drug Reporter*.

To-day, calcium chloride has become very cheap, in consequence of the great development of the soda ash industry by the ammonia process. At present it can be transported from long distances, and its cost delivered on the ground of the sulphur mines in Sicily should not exceed 9 francs by the hundred kilograms (220 lbs.). The apparatus used by De la Tour Dubrenil may be described as consisting of two rectangular boilers made of sheet iron, having a capacity of about 2 cubic metres (2 metres by 1·30 metres and ·75 metres in height). The bottom of these boilers inclines one-tenth. They are mounted on a furnace so that each one of them can in turn be heated by the same hearth, which is fed by either lignite, coke or coal. The ore is piled or heaped up in one of the boilers, a solution of calcium chloride so concentrated that it will not boil below 120° is poured in and heat applied. The sulphur melts little by little, and on opening a valve at the bottom the liquid is collected directly in moulds.

The entire operation with the ore in rocks lasts about two hours. Towards the end of the operation the sulphur will no longer flow when the valve is opened. The bath of chloride is then turned off into the adjoining boiler, which has been previously charged with ore, half of the liquid is poured off by means of the connecting cock between the two boilers, the remainder is received into a vat situated under ground and is elevated by means of a pump.

The residue is quickly washed in order to remove the calcium chloride with which it is impregnated, and the diluted liquid thus obtained serves to compensate for the evaporation of the bath. As soon as possible the heat is applied to the second boiler already charged, and the exhausted ore removed from the first one in order to prepare for a new charge.

The work is so accomplished that the operation may be practically considered a continuous oue.

The sulphur obtained in this way contains not more than ·001 to ·002 per cent. of impurities, while that obtained from the "calcarone" contains up as high as 2 to 3 per cent.

Besides, the residue does not retain more than 4 to 5 per cent. of sulphur by this process. In this process, certain of the ores become completely disintegrated, and in consequence in the powdered sulphur there were frequently found portions of earthy matter. De la Tour Dubrenil was, therefore, obliged, in order to obviate this great difficulty, to completely modify their apparatus.

The new arrangement which has been adopted can be applied to the treatment of all varieties of ores.

The boilers are arranged horizontally and divided through the centre, that is lengthwise, by a large drain, which alone has the desired slope in order to permit the flowing off or draining off of the sulphur. On the edges of this drain two vertical gratings of iron are arranged which hold the ore on each side and allow the centre to be entirely free. These gratings are made of bars of iron 2 millimetres in thickness and 25 millmetres long, and placed 3 millimetres apart. In consideration of this new arrangement it is possible to break all kinds of ore in this apparatus. In fact, even powdered mineral, such as the *débris* resulting from grinding, which is very rich, and which is designated in Sicily by the name of *sterri*. This *débris*, which up to the present time has lain neglected on the ground where the mineral is treated, can now with great facility be made to yield this sulphur in this apparatus.

This *sterri* is always richer than the general portion of the ore mined, because during the grinding or breaking up of the mineral the rock breaks and naturally divides according to the layers which are rich in sulphur, as they offer the least resistance. In consequence of its friability, the sulphur becomes partially reduced into dust, which thus forms a large portion of the *débris*.

At the Tronica Mine, in the Province of Caltanisetta, of Sicily, the ordinary mineral yields 20 per cent. of sulphur by the treatment in the calcium chloride bath, while the "sterri" from the same mine gave 72 per cent.

The ordinary run of ore in Sicily yields 12 to 13 per cent. of sulphur, with the "calcarone" reaching 15 to 17 per cent. in certain mines.

In comparative tests made with the same ore, 10 to 12 per cent. of sulphur were obtained in the treatment with "calcarone," and 19 to 23 per cent. by fusion in the calcium chloride bath.

It has been noted for some time back that very rich ores gave bad results when treated in the "calcarone:" in most cases the combustion is too rapid, and the sulphur becoming brown and pasty by the overheating flows only with difficulty.

It is necessary, therefore, in treating such ores to mix them with inert substances, and the yield in such cases does not correspond with the original richness.

On the other hand, the rich ores can be treated very advantageously by the chloride bath. From the results obtained by De la Tour Dubrenil, after treating a large quantity of "sterri," it was found that 12 fr. 75c. was about the price for the extraction of a ton of sulphur in cases where the average yield of the ore was 33 per cent. of the original weight. The price of the treatment of a charge of the apparatus, which is about 1000 kilograms, may be figured as follows:—

35 kilos of fuel (from coal mixed with lignite) . . . . . fr.	1.05
14 kilos of calcium chloride, at 9 fr. the 100 kilos	1·25
Labour	1·25
Contingencies and other expenses 20 per cent.	0·70
Total	4·25

That is, in order to obtain a ton of sulphur it is necessary to charge the apparatus three times, which places the price of extraction at 12 fr. 75c. An operation with the "sterri" requires an hour and a quarter for fusion, a quarter of an hour for running the sulphur out, and finally, an hour and a half to wash the residue, collect the solution, empty the boiler, and to replace the movable gratings in their original positions.

De la Tour Dubrenil have already placed quite a number of their apparatus in operation principally for the treatment of these "sterri." There are three at the Tronica Mine, in the Province of Caltanisetta, two at the Grottarossa Mine in the same province, two at Permie, near Recalmute, two at the Crocca Mine.

The process which we have just examined has several important advantages, among these are the following:—

First. The extraction of the greater portion of the sulphur from ores of all kinds, even from "sterri," the use of a small amount of fuel, or at least of a fuel which is inexpensive. Second. A continuous extraction having but little effect upon the atmosphere. Third. The suppression of sulphurous acid, thus making it possible to extract the sulphur continuously throughout the year. Fourth. The treatment of the ore in proportion to the mining and the shipping of the sulphur at times favourable to its transportation.

DETECTION OF CHLORINE, BROMINE AND IODINE.*

BY C. THOMPSON.

In the *Chemical News* (vol. xlviii., p. 296) there appeared a process by Mr. Jones, for detecting chlorine, bromine and iodine in presence of each other. The process was

* Report on Analytical Chemistry read before the School of Pharmacy Students' Association.

as follows:—"Place a small quantity of the mixture to be tested in a good sized test-tube, add a few pieces of manganese dioxide and then a little water. Add now 1 drop of dilute sulphuric acid (1 part acid to 10 parts of water), a brown tinge indicates the presence of iodine. Boil the mixture and confirm the presence of iodine by the violet vapours in the upper part of the tube. Continue the boiling till these vapours cease to appear, then add another drop of sulphuric acid and boil again until they cease. If necessary, repeat this addition of acid and boiling until violet vapours have entirely ceased. Now add about 2 cubic centimetres of the dilute acid and boil again; brown vapours indicate bromine, Continue the boiling until the vapours no longer smell of bromine, then add another cubic centimetre of dilute acid and boil again. When the vapours no longer smell of bromine, allow the tube to cool thoroughly, add an equal bulk of strong sulphuric acid and warm; a green gas bleaching a piece of moist red blotting-paper at the mouth of the tube indicates chlorine Occasionally some more bromine comes off on the addition of the strong sulphuric acid, but if so, it is soon got rid of and is succeeded by the chlorine, which is chiefly evolved on heating the mixture. As, moreover, red blotting-paper is far more quickly acted on by chlorine than by bromine there can be no difficulty in distinguishing between the two." Mr. Jones also adds that he has found this process to compare very favourably with others. This process is somewhat similar to that recommended by Vortmann, except that sulphuric acid is the active agent instead of acetic acid. Mr. Barnes has shown that unless very great care is exercised, Vortmann's process is not trustworthy; so that it would not at first sight seem likely that Mr. Jones's process in which sulphuric acid is to be used would answer much better.

Experiments tend to confirm this statement. If there be a large excess of iodide over that of the bromide present in the solution or mixture to be tested, or if, *vice versâ*, the bromide be in excess, then this result seems to follow in nearly every instance; viz., that the vapour of that halogen which is present in a very small quantity relatively to the quantity present of the other halogen is likely to be overpowered by the vapour of the latter. When relying only on the colour of the vapour it was found that when the proportion of the iodide to the bromide was less than 1 to 14, the iodine could not be detected, and even when paper moistened with starch solution was used, there was no indication of iodine if the proportion was less than 1 to 20. As regards detecting bromine, following the process, and relying on the colour of the vapour only, it was found that the bromine could not be detected if the proportion between the bromide and iodide present was less than 1 to 15; when filter-paper moistened with iodide of potassium and starch solution was used, it was possible to detect the bromine so long as the proportion between the bromide and the iodide is not less than 1 to 22.

When the chloride is present in small quantities relatively to the iodide and bromide, or more especially if it be the bromide which is in excess, it is not easy to detect it by this method; for when the bromide is in large excess it is not all driven off by the addition of the dilute sulsulphuric acid, so that when the strong acid is added the remainder comes off and takes along with it the chlorine.

As a rough way of detecting the presence of either one or of all three of the halogens, when present in fair quantity relatively, this process will answer, more especially if the colour of the vapour be not alone relied on, but filter-paper moistened with starch solution for the iodine and with iodide of potassium and starch solution for the bromine be used.

As a delicate test for detecting the presence of small quantities of either one of the three halogens in presence of the other two it is not to be relied on.

THE SO-CALLED BISMUTH BREATH.*

BY WILLIAM REISERT, PH.G.

Bismuth oxynitrate, when taken into the human system, often imparts to the breath a very perceptible, and disagreeable garlic-like odour, which is very annoying, not only to the person who has taken the salt, but particularly disagreeable to the persons with whom he may come in contact. This odour has been attributed by writers to be caused by impurities in the bismuth salt, such as arsenic and tellurium, and some have asserted that the chemically pure bismuth salt itself produces the odour. The subjoined experiments will add to the already known facts concerning the cause of the production of this odour, namely, the ingestion of tellurium, which element occurs as an impurity in many samples of bismuth oxynitrate.

Chemically pure sesquioxide of bismuth was prepared by dissolving the commercial oxynitrate in chemically pure nitric acid, and precipitating with an excess of water. This operation of redissolving and reprecipitating was repeated twice, and the precipitate was then strongly heated in a porcelain crucible to convert it into bismuth sesquioxide, and at the same time to volatilize any arsenic which might have been contained in the substance. Tests for arsenic and tellurium in the resulting sesquioxide failed to denote their presence.

The bismuth sesquioxide thus purified was administered to five persons under the same, and under different conditions as to dose and time. From 0·5 to 1·0 gram was given three times daily for six days. No garlic-like odour could be recognized in the breath.

To investigate the action of arsenic in the production of this odour in the breath, arsenious oxide was taken by myself, in doses of 0·003 gm. after each of the three daily meals for three days. On the fourth day, on account of the griping pain produced in the abdomen, and a violent diarrhœa, only two doses were taken. There was not the slightest garlic-like odour perceptible in the breath.

Tellurium is comparatively rare, and is contained in many of the ores of bismuth. The mineral tetradymite contains as much as 49·79 per cent., wehrlite, 29·74 per cent., and joseite, 15·93 per cent. of the element. In a sample of metallic bismuth from Bolivia, Schneider† found 0·14 per cent. of tellurium. Brownen‡ found tellurium in the commercial bismuth oxynitrate, but it was not present in large quantity. On account of difficulties in its separation from bismuth, it often occurs as an impurity in the commercial bismuth oxynitrate, yet in most cases the quantity present is very minute. If more care were used in the preparation of the commercial oxynitrate, less would be heard of the so-called bismuth breath. Repeated precipitation and washing will entirely remove the obnoxious element.

As early as 1824 the odour produced by the ingestion of tellurium compounds was noticed by Gmelin.

In 1853 Hansen§ investigated the cause of the production of the odour. This investigator experimented upon himself and a friend, and upon dogs, with potassium tellurite. This salt, in doses of 0·030 to 0·080 gm., taken by himself an hour before each meal, gave the garlic-like breath within a few minutes after the first dose, and this odour soon became so strong that he had to seclude himself from society. He continued the doses during seven days, his friend continued the doses for two days with similar effect, and noticed the odour in his breath for eight days afterward.

It is also stated that Wöhler, when investigating the volatile telluride of ethyl, noticed this same odour in his breath, and one night, when perspiring freely, the odour

* From the *American Journal of Pharmacy*, April, 1884.

† *Journ. f. Prakt. Chem.*

‡ *Pharm. Journ.*, October 16, 1875; *Amer. Journ. Phar.*, 1876, p. 133.

§ Liebig's *Annalen*, lxxxvi., p. 208.

of the perspiration was almost unbearable. In the experiments on dogs the garlic-like breath was perceptible after one minute. Hansen quotes Gmelin as having in 1824 given tellurous acid to a dog and a rabbit. The rabbit only was killed, and on dissection gave off a garlic-like odour.

Sir J. Simpson* records a case in which a divinity student inadvertently swallowed a dose of tellurium, which was followed by the evolution of such persistent odour that for the remainder of the session the patient had to sit aside from his fellow students.

The experiments in this direction made upon several friends, and also upon myself are as follows :—

Tellurous oxide (TeO_2) was prepared by treating metallic tellurium with nitric acid, evaporating to dryness and igniting the product. Some of the resulting tellurous oxide was taken by myself in doses of 0·005 gm. each. Three doses were taken on May 8, 1883, at 1, 4, and 7 o'clock p.m. In fifteen minutes after the first dose the breath had a strong garlic-like odour, and in an hour a metallic taste was observed. An hour after the second dose the urine and sweat had the garlic-like odour, which was also observed in the fæces on May 12. The metallic taste was observed for seventy-two hours, and the garlic-like odour in the urine for three hundred and eighty-two hours, in the sweat for four hundred and fifty-two hours. in the fæces for seventy-nine days, and in the breath it was still present, though very faintly, after two hundred and thirty-seven days.

In order to determine the smallest quantity of tellurous oxide which would be required to produce the garlic-like odour the following solutions were made :—

I. 0·001 gm. of tellurous oxide was dissolved in potassium hydrate and sufficient distilled water to obtain 100 cubic centimetres. 5 c c. contain 0·00005 gm. tellurous oxide.

II. 0·00025 gm. of tellurous oxide was dissolved with the aid of a little hydrochloric acid in sufficient distilled water to make 100 c.c. 5 c.c. are equal to 0·0000125 gm. of tellurous oxide.

III. Made like the preceding, but diluted to 200 c.c. 5 c.c. are equal to 0·00000625 gm. tellurous oxide.

IV. 0·0001 gm. tellurous oxide, sufficient hydrochloric acid and water to measure 100 c.c. 5 c.c. are equal to 0·000005 gm. tellurous oxide.

V. Like the preceding, but diluted to 500 c.c. 5 c.c. are equal to 0·000001 gm. tellurous oxide.

VI. 100 c.c. of solution V. was diluted with 100 c c. of distilled water; each c.c. represents 0·0000001 gm. tellurous oxide.

These solutions were given to a number of young men; but no one was experimented upon a second time.

I. After one dose of 5 c.c. of this solution, the garlic odour became perceptible in the breath in thirty-five minutes and lasted about seventy-five hours.

II. Three doses of 5 c.c. each were taken after three succeeding meals. The odour was noticed in the breath thirty minutes after taking the third dose, and continued about sixty-six hours.

III. Five doses of this solution of 5 c.c. each were taken after five succeeding meals, when the odour was soon noticed, and lasted about ninety hours.

IV. After six doses of 5 c.c. each, the odour was quite distinct; three additional doses were taken and the odour lasted ninety-six hours.

V. Five doses of 5 c.c. each were taken after five consecutive meals; the odour was noticeable in forty-five minutes and lasted seventy-three hours.

VI. After one dose of 5 c c. the garlic odour was perceptible in seventy-five minutes and lasted about thirty hours.

Smaller quantities of this solution were then given, namely, 1 c.c. to each of two young men, 2 c.c. to two persons and 3 c.c. each to three persons; but no garlic-like odour could be detected.

* Blyth, 'Manual of Chemistry,' Lond., 1879.

The nature of the compound which possesses this garlic-like odour is, as yet, not understood, although Hansen attributes the odour to be caused by a volatile organic compound of tellurium like the telluride of ethyl, which is given off by the lungs and skin. Both methyl and ethyl telluride have a garlic-like odour.

In this investigation the breath of myself, which was exceedingly strongly impregnated with the garlic-like odour, was for several hours passed through a tall column of distilled water contained in a wash bottle, and the water afterward tested for compounds of tellurium, but not even a trace of this element could be found. However, from the minute quantity of the element which is required to produce this odour one would hardly expect to find by qualitative testing even the merest trace of the element in the breath. Necessarily, the presence of tellurium in such a minute quantity in the great majority of samples of the bismuth oxynitrate would prevent its detection by any of our chemical tests. From this failure to detect tellurium most likely have arisen the many statements* of its non-presence in the commercial bismuth oxynitrate. The physiological test seems to be the most delicate, as it has been shown that in this way as little as 0·0000005 gm. or $\frac{1}{2000000}$ of a grain of tellurous oxide, equal to 0·0000004 gm. or $\frac{1}{1000000}$ of a grain of the metal, may be detected.

In these experiments idiosyncrasy seems not to have had any influence at all. Every one to whom the tellurium compound was administered in sufficient quantity was affected with the garlic-like odour.

CINCHONA ROBUSTA.

The following passage concerning this hybrid appears in the recently issued 'Report on Kew Gardens for 1882':—"In the Kew Report for 1881, pp. 25, 26, I referred to the hybrid between *succirubra* and *officinalis*, which seems in the East first to have made its appearance in Ceylon, and thence to have been introduced by seed into the Sikkim plantations.

"This form has, during 1882, given rise to a rather protracted correspondence with the Madras Government. Mr. Cross, who was employed by the India Office to convey the Columbian barks from Kew to Southern India, insisted that the two supposed hybrid forms grown on the Nilgiris, under the names of *pubescens* and *magnifolia*, were not hybrids but distinct species, of which the seed had been sent by himself from the slopes of Chimborazo. After some shifting of opinion he seems finally to have settled down to the statement that *magnifolia* was the cinchona called in the Chimborazo bark district 'Pata de Gallinazo,' that *pubescens* was true *succirubra*, and that the *succirubra* of the Madras plantations was *micrantha* (grey bark).

"In all these identifications his recollections of plants seen no less than twenty years before seem to have misled him. Unfortunately, his views were, to a certain extent, adopted by the eminent quinologist, Mr. Howard, and it therefore became necessary to critically examine them, as such gigantic errors in nomenclature could not but very seriously affect the future policy of administration of the Madras Cinchona plantations.

"Under instructions from the Madras Government, very copious and carefully prepared sets of all the cinchonas cultivated in the Nilgiris were despatched to Kew, both by Colonel Beddome and by Surgeon-Major Bidie, the Superintendent of the Madras Central Museum. They were very thoroughly examined, and there appeared no valid reason for disputing the accepted names under which the plants had been grown or for adopting those assigned to them by Mr. Cross.

"The authentic specimens of the Pata de Gallinazo, collected by Spruce, and described by him in his official report, are preserved in the Kew Herbarium. They have been subsequently identified at Kew by Spruce

* Dr. Squibb, *Ephemeris*, Sept. 1882.

(confirmed by Howard) with *C. erythrantha*, Pav., and Triana, the most recent monographer of the genus, has referred this species as well as Spruce's specimen to *C. pubescens*, Vahl. Neither the *magnifolia* nor *pubescens* of the Nilgiri plantations can in any way be confounded with *Cinchona pubescens*, Vahl, but are, no doubt, as has always been contended, marked members of the variable series of hybrids which appear to invariably arise in plantations where *officinalis* and *succirubra* are cultivated in proximity.

"Mr. Cross's other two conclusions proved equally baseless. As, however, these questions of synonymy had excited a good deal of perplexity in Ceylon as well as in Southern India, I suggested to the Government of Madras that Dr. Trimen, the Director of the Royal Botanic Garden, Peradeniya, should be invited to visit the cinchona plantations of the Madras Government, in order to bring about if possible some uniformity of nomenclature in the forms and species of cinchona cultivated both in Ceylon and Madras. This he accordingly did, and he has given the results of his exhaustive study of the whole question in a very able and lucid report (dated June 30, 1883) which, representing as it also does, the opinions arrived at by the Kew staff, appear to me to finally dispose of the whole subject. Both the names *pubescens* and *magnifolia* Dr. Trimen, for reasons which he gives, proposes to discard in favour of *robusta*, which is in use on some estates in India, and 'is now commonly employed in Ceylon for the trees in question.' Dr. Trimen describes those he saw on the Nilgiris in the following words:—'I found the forms to be just those so common in Ceylon plantations. Generally robust well grown trees, larger, hardier, and healthier than either the *officinalis* or *succirubra*, among which they were scattered and often flourishing where neither of them can thrive. Botanically, there was the same range of variety, the extreme form in one direction, with its dark green smoothly shining leaves, closely approaching some of the large-leaved forms of *C. officinalis*; and that in the other direction with its larger, paler, thinner leaves more or less pubescent beneath, so close to the hairy form of *C. succirubra* as to be often with difficulty distinguished from it. Between these, as regards colour and pubescence, were many intermediates, though undoubtedly, with a little ingenuity, the whole can be thrown into two groups.'

"He further adds:—'We have direct testimony of its origin. I am assured by planters of credit that they have grown both glabrous and pubescent *robusta* from seed of ordinary *officinalis*, and that it is by no means unfrequent for seedlings of them to appear in seed-beds on estates where no trees but *officinalis* and *succirubra* occur. I have myself seen seedlings of *robusta* self-sown where there are no parent trees of the sort whence they could have been derived; and at one time I was inclined to regard it merely as a variety of *officinalis*. There are, I think, grounds for believing that *succirubra* generally supplies the pollen, and is therefore the male parent, both in the case of *robusta* (*succirubra* and *officinalis*) and *anglica* (*succirubra* and *calisaya*).'"

AMERICAN MUSK.*

BY R. S. CRISTIANI, PHILADELPHIA.

There has been a good deal of literature on this subject for two or three years past, much of which has been written by myself, and which has, I believe, attracted some notice both here and in Europe, for to obtain a good substitute for the very costly Tonquin musk has long been an object of great importance in all business countries, and the principal object of my writings has been to place the article in commerce, that all who desire it may know where to procure it.

The style "American Musk" is a title I have given it, as the animal from which it is obtained is indigenous to this country. This is the well-known rodent, the musk-rat (*Fiber Zibetica*), which frequents the streams and marshes of nearly all the States and Canada, having habits similar to the beaver. The musky secretion is found in two small sacs situated below the anus and near the genital organs. It usually adheres to the skin when removed, and is collected in a very indifferent way, if not thrown away as worthless by those who handle the pelts, as it is desirable they should be as free as possible from the odour.

This animal, when plentiful, is trapped for its skin—the fur being quite fine and soft—and shipped in large quantities to Europe, where they have great skill in dressing and dyeing furs, and it is made to imitate more expensive goods, such as seal, otter, etc. The winter and spring are the seasons that this trapping mostly occurs, and the spring is the only season when a supply of the musk pods can be obtained.

I have mentioned that there has not been any systematic attempt made to collect and prepare this valuable substance, except by myself, and with my many duties I have not been able to give it the attention it certainly deserves; yet I have had much correspondence on the subject here and from Europe, and especially from London, where there has arisen some demand for the article, owing principally to my efforts, but my time to devote to the subject has been limited and many opportunities to forward the subject unavoidably neglected. One reason why this valuable article is neglected, is the great ignorance of the persons who collect it, as they fail to take off the sacs carefully and often leave a quantity of membrane and fat adhering to them. Moreover, they have no knowledge of a proper mode of preparation to prevent decay, and the attack of insects, etc., so that the article would keep and be fit for sale at all seasons, for when the weather moderates they often find it unfit for use and worthless. Preservation is all important, if this musk is to be an article of commerce, and I think it soon will be; but it can scarcely be expected that such will be the case if it can only be procured two or three months in the year.

Let it not be supposed that I claim for the American musk all the properties of the true musk, far from it, for that valuable drug stands at the head of all analogous substances, having qualities that are not found in any known substance. But as a substitute in many manufactures, such as toilet soaps, and some secondary articles of perfume—and perhaps some flavours—I know of no article that is as good a one, and in soaps particularly it is invaluable, I having furnished it to some of our large manufacturers for some seasons.

The object of my present article is to call more attention to the collection of the musk-rat pod, in the States and Canada, as the season will soon open for the trappers, and the pelts will arrive at the usual centres in the late winter or early spring, and that those who deal in and handle them may see a source of profit in saving the odorous sacs. Should those who are interested in the article want further facts, they can correspond with me.

* From the *Canadian Pharmaceutical Journal*, April,

AMERICAN DRUGS.*

BY J. MOELLER,

Botanist and Microscopist of the Imperial Forest Institute, Mariabrunn, near Vienna.

(*Continued from page* 865.)

TONGA.

Coarsely cut, partially pulverized stalks of two different and easily distinguishable plants. The mixture has a strong odour reminding one of fenugreek.

The greater bulk of this drug consists of irregularly-shaped fragments of the stalk of a plant, seldom exceeding 2 cm. in length, sometimes, perhaps, as thick as a man's finger, very light and porous on the cut or broken surfaces or barkless portions, covered with a cork-coloured or dark brown bark; or of round stalks of the thickness

* Reprinted from the *Therapeutic Gazette*.

of a quill and ribbed lengthwise; or of flat pieces of bark, which, to judge from their size and form, evidently belong to said fragments. A glance at the horizontal section of one of these pieces with a magnifying glass proves distinctly that the varied shaped component parts belong to one and the same monocotyledonous species. The stem is composed of closely arranged bundles of dense fibres and covered by a comparatively thin bark traversed by hard, whitish streaks. This part of the drug has a specific odour and a delicate taste, slightly reminding one of vanilla.

Microscopic Characters.—The peridermis consists of five to eight rows of flat cells, some of which are thin-walled, the majority, however, being thickened almost to obliteration. The cells of the bark parenchyma are large and thin-walled, scarcely 0·5 mm. broad and covering but a small area. In older plants they reach 2 millimetres in width and have numerous irregularly disposed fibres which are, each of them, distinguished by a well-developed bast bundle presenting a kidney-formed section, in the concavity of which, which always faces inwards, are a small number of narrow tracheæ. A few isolated, spindle-shaped, strongly solidified bast fibres, 0·025 mm. in diameter, are to be found irregularly distributed amongst the parenchyma. The vascular bundles of the plant are

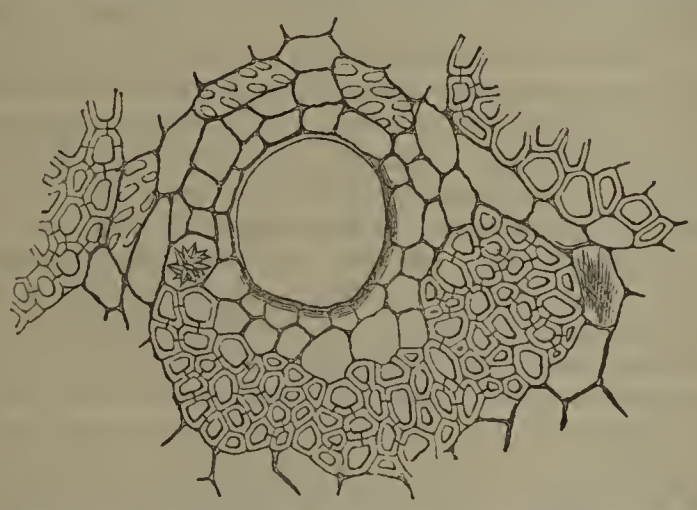


Fig. 14.—Vascular bundle from the central portion of the stalk of *Rhaphidophora Vitiensis*.

distinct from the peripheric fibres owing to the different location of the bast and the greater development of the wood, in which occurs a single vessel, or more seldom a pair of vessels, distinguished by a broad lumen (0·15 mm.). Raphidæ and glandular ducts are found within the principal parts of the stem and especially in the bark parenchyma.

This ingredient of the tonga is derived, as Holmes (*Pharm. Journ. and Trans.*, 1880, p. 889) had first suspected, and as has since been repeatedly proved, from a species of Aroid found in the Fiji and New Hebrides Islands, and known under the name of *Raphidophora vitiensis*, Schott. It is a variety of the *Raphidophora pertusa*, Schott, *Monstera pinnatifida*, C. Koch, found on the coast of Coromandel, in Ceylon, Java, Timor, and in those parts of Australia which lie within the tropics. N. E. Brown, in *Gardner's Chronicle*, designates *Epipremnum mirabile*, Schott, *Raphidophora lacera*, Hassk., as the plant from which this ingredient of tonga is obtained; but this is probably an error, since the latter variety has hitherto been found in Java only, while we know that tonga was first produced and brought from the Fiji Islands. These two varieties are, however, closely allied. They belong to the forms of Araceæ which A. Engler distinguishes by their double-rowed leaves, by their branches ending in a flower, and in each vegetation period springing afresh from the shoulder of the leaf again to a flower. The Raphidophora of the Fiji Islands, called by the natives "nai-yalu" or "walu," is a creeper whose vines, to judge from the fragments thereof as found in commerce, attain the thickness of a man's thumb, at least.

The other and less bulky component part of this drug, consists of small particles of bark, seldom as large as a finger-nail, and not more than 1 millimetre in thickness. The outer side of this bark is scaly, and in colour it varies from an ochre yellow to a tile-brown hue; the inner side is dark brown and wrinkled. It is a fine-grained, brittle bark, showing a chocolate-coloured section sprinkled with bright spots or points, and is wholly insipid and odourless.

Microscopic Structure.—The corky layer, which is no thicker than paper, is composed of cubic cells, with walls almost always very thin on the inner side, but occasionally thickened. This coating lies immediately contiguous to

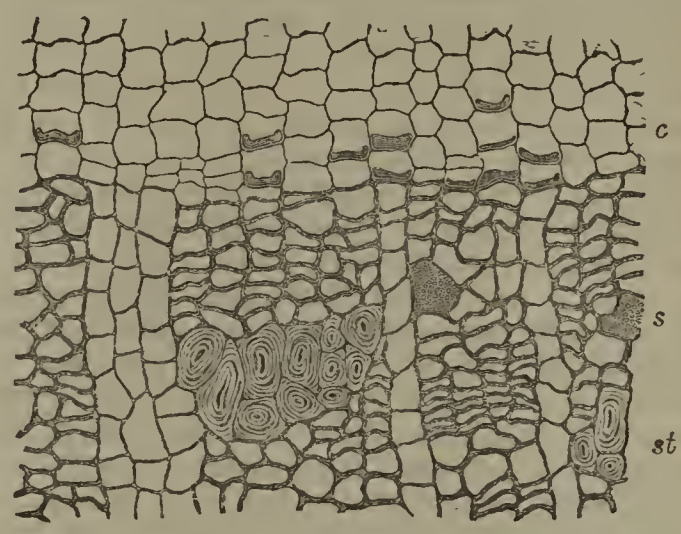


Fig. 15.—Section through the bast of *Premna Taitensis*. *c*, cork; *s*, sieve-plate; *st*, stone-cells.

the inner bark, which is traversed by one- to three-seried medullary rays, the alternating spaces between which seldom exceeding 0·5 mm. The bast rays consist of alternately arranged layers of parenchyma and sieve tubes; the membranes of both are dense, present an almost gelatine-like appearance, and are wholly devoid of bast fibres. On the other hand, groups of parenchyma often become sclerotic, which change is frequently accompanied by a moderate increase of their elements, the form of which, however, is not materially changed. The density of the walls of these, although formed of the most delicate layers, increases to an almost complete solidification, but they are still perforated by numerous minute pores, visible only under a very powerful microscope. Where the stone cells of neighbouring groups come in contact with each other, which, by the way, but seldom occurs, the medullary ray passing through them becomes sclerotic. Nearly all the medullary ray cells, as also many of those of the bast-parenchyma, are heavily charged with crystal sand or rhaphides. The sieve-tubes are somewhat more open; their transverse plates are occasionally to be seen in the section of the bark itself. (See Fig. 15.)

Mueller says that this ingredient is the bark of the *Premna taitensis*, DC. (*Pharm. Centralb.*, 1881, p. 548), a species of the Verbenaceæ found on the Society Islands, and called "aro" by the natives, and in this he is corroborated by its anatomical structure. (Compare Tectona, J. Mueller, 'Anatomy of the Barks,' p. 176.)

The plant is a shrub or small tree, the smaller twigs of which are somewhat sticky; its leaves, which grow to the length of 8 cm., are oviform, shortly acuminate, heart-shaped at the base, smooth and naked on both surfaces, and shiny on the upper side. The stem of the leaf, as also that of the blossom, is, to some extent, hairy. The flowers are very small and arranged in large groups at the end of the twigs on which they are found. The calyces are slightly cup-formed, almost double-lipped. The small whitish blossom contains four stamens attached to the tube. The fruit is a pea-formed berry, containing one seed.

It is and has long since been well known, that the leaves of certain other varieties of *Premna* (*e.g.*, *P. fœtida*, Reinw., *P. integrifolia*, L.) are used as food, particularly for flavouring purposes, in the Sunda and Molukka Islands and in East India.

In view of the variations (see Gehe and Co's Commercial Report, September, 1880) in the samples of this drug

on its introduction, it is perhaps necessary for me distinctly to state that the samples of tonga which I have at various times received from America have always been found to be exactly alike and to contain invariably the two ingredients mentioned alone, and never leaves.

The London doctors, Ringer and Murrell, first recommended this drug as a remedy for neuralgia (see *Pharm. Centralb.*, 1881, p. 30) and it soon attained great notoriety.*

The *Lancet*, March, 1880, says that Sydney Ringer received this remedy from a Mr. Ryder, who brought it from the Fiji Archipelago, stating that a certain European, who had married the daughter of a chief, had learned the secret from his father-in-law, in whose family it had been an heirloom for some two hundred years—the old story, with slight variations, so often told before, of drugs our knowledge of which first came from the missionaries. This first sample of tonga was subjected to a chemical analysis by Gerrard (*Pharm. Journ. and Trans.*, 1880, p. 849), the sole one as yet reported. The fibres contain a volatile alkaloid, to which possibly it owes its virtues, such as they are, and which for the present we may call "tongin." The most important parts of the bark are, pectin, glucose, a little ethereal oil and fat.

Tonga has not been able to firmly establish itself in Germany as an anti-neuralgic remedy. The *Pharmaceutische Centralb.*, of December, 1881, says that this much-lauded medicine had even then become nearly forgotten in that country. In reply to this *The Therapeutic Gazette*, 1882, p. 40, says, rather mischievously, that the German faculties cannot be blamed for declining to handle a drug of the composition of which they know but little, if anything. Faculties are certainly not noted for experimenting with drugs of this nature, but should it appear that the drug under consideration has merit, we may entertain the certain hope that this obstacle to its full investigation will be overcome in due season.

GINGER BEER PLANT.†

BY W. G. SMITH.

The Editor of the *Gardeners' Chronicle* has several times been requisitioned by correspondents (mostly anonymous) for a scientific description of the "Ginger Beer Plant." The correspondents want to know its botanical name and native country. The writer of this note has also been tormented weekly, almost daily, on the same subject for two or three years. Every one has been asking him for the "regular Latin or Greek name" of the "Ginger Beer Plant." Benevolent old ladies, clergymen and officers of the Blue Ribbon Army, have called upon him, or written for a scientific explanation, hoping to make the "Ginger Beer Plant" a boon to the poor. One person wished to feed paupers with it; another hoped by its means to knock all the publicans on the head; a third to send it in barrels for the army in the Soudan. When such persons have been told it is merely a form of German yeast they have turned away disappointed and disgusted. Something more must evidently be done for this rum shrub, of which I have recently had application for slips, rooted cuttings and seeds.

The last letter sent to the *Gardeners' Chronicle* was to this effect:—"I cannot learn anything more about it than that it is an American plant. Cannot find out where it is procured—only how to make it. Empty the contents of the small bottle into the wine-bottle. Bruise about half an ounce of ginger, two tablespoonfuls of white sugar, put in a jug, pour boiling water over it, let it stand till nearly cold, then put the plant in the bottle of ginger, sugar, and water. Cork it tight, and when it begins to ferment the cork will fly out. The plant will grow if fed every day, and soon be enough for two bottles. It is best to empty it once a week into a pan and wash it with cold water, then put it in the bottle again."

To the unaided eye the Ginger Beer Plant looks like a lump of paste, and when placed under the microscope it is seen to consist of more than one of the yeast fungi, in a mucilaginous medium. It belongs to the group of fungi termed Saccharomyces, of which there are many species, the one used for beer being *S. cerevisiæ*. Mr. Berkeley, Mr. Hoffmann, Mr. Huxley, and many other gentlemen, British and foreign, have written about yeast in its different forms and conditions.

The "Ginger Beer Plant," like all other yeast fungi, excites fermentation in sweet solutions and sets free carbonic acid gas.

As all the correspondents insist on this "American plant" being a new species I propose to humour them by calling it *Zingibeerophora spumacephala*!

LIVAROT CHEESE.*

One of the most popular cheeses in France, and one which is not only profitable in its manufacture but well adapted to our dairy farmers, is the Livarot, and the following is the description given of it by Mr. Long in one of his South Kensington lectures:—The cheese takes its name from the town of Livarot in the department of Calvados, which is the principal centre of its manufacture. To the workmen it is almost indispensable. The milk taken from the cow is creamed on the following day, and poured into large wooden tubs holding about fifty gallons, being then brought to the temperature which it possessed on leaving the cow. The rennet is then added—in summer one, and in winter two dessert-spoonfuls being required for six gallons of milk (as a rule this rennet is made on the premises, several calves' stomachs being cured together),—and for each a large spoonful of salt and three glasses of water are added. In one or two hours the coagulation is complete, when the curd is broken up and laid upon rushes or a clean cloth. Before placing in the moulds it is indispensable that the curd should be reduced to small cubes no larger than lumps of sugar. The curd is placed in the circular wooden moulds after having been left to drain for a quarter of an hour. In these moulds it completely drains and attains a proper consistence. This result can be obtained in three or four hours when it is warmed, but the quality of the cheese will be impaired, and it must not be left too long in the moulds—one to four days, according to the season of the year and the temperature. The moulds are turned over one hour after the curd has been placed in them, this operation being repeated half a dozen times before the cheeses are released. The cheeses are salted with the hand, and left for four or five days on inclined wood or stone tables, and then taken to the *hâloir* or market. The *hâloir* is an apartment with windows let into opposite walls, through which a current of air passes for the purpose of desiccating the cheeses placed in various stages upon lath racks, which have been previously covered with straw. The cheeses are left in this place for fifteen to thirty days, and then taken to the cave, all the apertures of which are closed and a uniform temperature kept. In consequence of the gas given off from the cheese the walls are not made of brick or stone, but of mortar mixed with chopped hay. The cheeses, placed on planks, are turned twice weekly in winter, and three times weekly in summer, being slightly wetted each time with pure water, and salted afresh where necessary. At the end of eight or ten days in the cave they are placed on their edges on a species of sedge to assist the process of drying. They remain in the cave for three to six months, according to their size, and when packed for transmission to market are coloured with annatto. It requires about five pints of milk to make a cheese, September and October being the months chosen in which to make them. Several manufacturers of these cheeses make from 5000 to 8000 dozen in a season.

* The name "Tonga" had previously been applied to a narcotic extract extract (see *Pharm. Centralb.*, 1881, page 100) derived from *Datura sanguinea*, R. and P.

† From the *Gardeners' Chronicle*.

* From *The Grocer*, April 26, 1884.

The Pharmaceutical Journal.

SATURDAY, MAY 3, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

CHEMISTS' ASSISTANTS IN FRANCE.

FOR some past a Parliamentary Commission, appointed by the French Chamber of Deputies, has been engaged in an investigation as to the causes which have led to the present industrial crisis in France and increased the number of the unemployed. In the course of the inquiry the Commission has taken the evidence of representatives of various callings, and amongst others of the officials of the Chambre Syndicale des Elèves en Pharmacie. By the courtesy of a correspondent we have been supplied with a copy of the evidence of the President of this Association, M. PARISOT, and as an extremely intelligent statement of the condition of a large class of pharmacists' assistants in France, as well as an expression of the views of his *confrères* as to the causes that have contributed to the disadvantages under which they consider they labour and the methods available for their alleviation, it naturally proves to be very interesting. The evidence consists partly of a written reply to what appears to have been a series of printed interrogatories addressed to the Association in common with other similar bodies, and partly of a supplementary *vivâ voce* statement which M. PARISOT was allowed to make before the Commission.

M. PARISOT premises that the general industrial crisis in France affects pharmacy as it does all other callings, but he expresses the surprise with which he has observed, in following the evidence given before the Commission, that all the callings officially represented were better remunerated than pharmacy, whilst they had fewer hours of labour. He estimates that the three thousand *élèves en pharmacie* in Paris receive on an average, when neither boarded nor lodged, 190 francs per month. For this they serve, on an average, fifteen hours a day, besides being liable to night duty, for which they receive no extra pay. It will be remembered by those who have read Mr. MÖLLER'S interesting account of modern pharmaceutical study,* that in France the pharmacentical student, after passing the required examination in the "classical" schools, has to serve three years in a pharmacy, after which, if he is in a position to do so, he proceeds to the three years' course in a school of pharmacy and the obtaining of a diploma. But it appears that in a considerable number of cases the pupil, from want of means or for other reasons, does not go on at once for a diploma and as he is still only an *élève* he obtains no amelioration of his position while acting as an assistant, notwithstanding his increased practical experience. It is estimated by M. PARISOT that in Paris there are from one hundred and twenty to one hundred and fifty *élèves* unoccupied and about two hundred who have been compelled to accept situations of much lower value than they are capable of filling. But it was admitted that the number of *élèves* not in a situation is affected by the fact that some of them necessarily leave their employment to attend the courses of lectures.

When we come to the causes to which the *élèves* attribute what they consider to be their present unsatisfactory condition, it is pleasant to find that there is no disposition manifested to raise trivial complaints against the employers as a class, but rather to find an explanation in circumstances that are unfavourable alike to employers and employed. It is worthy of note also that some of these circumstances are similar to those that have largely affected chemists and druggists in this country. During the last ten years, M. PARISOT says, the pharmacies in Paris have increased in number and decreased in value. Some of the new comers, in order to attract a connection, have sold specialties at a discount sometimes amounting to 25 per cent. Besides this, the hours during which pharmacies are kept open have been augmented, so that whereas before 1870 most of these establishments were not opened before half-past seven in the morning and were closed at half-past nine at night, they are at present opened at seven in the morning and are not closed until eleven at night, Nevertheless, M. PARISOT said he could refer to a dozen houses, which, although they have been conducted with the greatest care, have decreased in value during this time by two-thirds. So far as the *élèves* are concerned they appear to look for an improvement in their position in some enlargement of the field in which they may seek employment. The desire expressed to the Commission in their name is that a diploma of "chemist' should be instituted, which would allow *élèves* who do not possess the means for the purchase of pharmacies to enter manufactories of chemical products and other works as foremen, or in any other capacity in which their special knowledge and training could be utilized. To some onlookers this will appear like placing an unwarranted amount of faith in a name, for it is not quite clear why an *élève* who possesses capacity for such an appointment should not take one, if available, without waiting for a diploma. Another portion of the evidence, which, we confess, appears to us rather puerile, is that wherein a part of the depression under which *élèves en pharmacie* suffer is attributed indirectly to the unfair com-

* See *Pharmaceutical Journal*, [3], xii., 397.

petition of German chemical manufacturers. If it be true that certain products are regularly purchased in France and sent to Germany for manipulation, to be afterwards re-imported into France at a price 20 per cent. below their original cost, there might be reasonable ground for suspecting a fraud, but it would be a fraud that French chemists should be competent to detect and protect themselves from. Moreover, one of the cases mentioned as an illustration of the dishonesty of the foreign manufacturer,—that of the sophisticated quinine supplied to the hospitals,—appears to be singularly unfortunate, since, unless we are mistaken, the fraud was traced to the French contractor, who was convicted of the offence and sentenced to a term of imprisonment that has hardly yet expired.

THE USE OF METHYLATED SPIRIT IN MANUFACTURES.

The arrangement, based upon the experiments made by Professors Graham, Hofmann, and Redwood, under which persons carrying on in this country manufacturing industries involving the use of spirit of wine have now for nearly thirty years been exempted from the payment of duty upon the spirit they use, if it be previously mixed with methylic alcohol in certain proportions, has been such a decided boon that the withdrawal of it could hardly be contemplated with equanimity. In the United States, however, manufacturers have since the war of secession been under the disadvantage of using spirit upon which they have had to pay a tax equal to five or six times its actual original value. For various reasons the plan adopted in this country has been deemed impracticable there; probably one of the most forcible being that as at least one-half of the whole spirit revenue has been derived from alcohol used for manufacturing purposes the consequent loss seemed to be too great to incur. But the prosperity consequent upon peace has encouraged American financiers to contemplate even this eventuality, and for the last year or two the subject has been under the consideration of the Congress. Indeed, the question just now appears rather to lie between permitting the use of methylated spirit duty free and the abolition of the spirit duty in the United States altogether. Obviously either of these steps would be of vast importance to chemical manufacturers, and it is not surprising to find one so eminent as Dr. Squibb discussing the *pros* and *cons* of the question. In doing so he refers to some of the disadvantages attending the adoption of the artifice of methylating as a means of preventing fraud on the revenue, and he evidently uses them to enforce the argument for a total abolition of the duty. Fortunately or unfortunately, this latter course does not come within the range of the probabilities in British finance; nevertheless some of the points mentioned by Dr. Squibb have an important bearing upon the conditions under which manufacturers are allowed to use duty-free spirit in this country.

Referring to a Bill which has been introduced into the House of Representatives, having for its object to exempt from duty any spirit to which a definite percentage of methyl alcohol has been added, Dr. Squibb points out that it appears to be based upon the theory that methyl alcohol once added to clean spirit spoils it permanently and irrecoverably for drinking purposes. This, of course, is a fallacy, for it has long been known, as Dr. Squibb points out, that the methyl alcohol can be taken out with comparative ease, and that obstacles to the cleaning of methylated spirit so as to render it capable of being used as a beverage are dependent rather upon the honesty or fears of the manufacturer than upon any inherent difficulty in the operation. Indeed, the possibility of cleaning methylated spirit is recognized in the fact that the law forbids it to be done. In this country it is believed that the law-abiding spirit, confirmed perhaps by the vigilance of the Excise authorities, is sufficient practically to secure obedience to such a prohibition. But Dr. Squibb has evidently strong misgivings as to whether such an end can be attained in the United States, for he believes that many manufacturers would buy the methylated spirit, clean it sufficiently for their purposes at an expense of a few cents a gallon and take the risk of detection and a penalty following. To use his own words, "With a not uncommon disregard for law and indifference to crime, and with sufficient cunning and care, such practices could be easily carried on to any extent, and so long as the cleaned spirit was used strictly for arts and manufactures it would be argued that the intent of the law would be fulfilled and no harm done." But in view of the fact that spirit of wine containing the full proportion of methylic alcohol is utterly inapplicable for many purposes in the arts and manufactures, such practices would interfere with the business of honest manufacturers and tend to diminish their profits, because they would have to compete in business with less scrupulous opponents.

So far the questions raised by Dr. Squibb, although of indirect interest to other countries, affect principally the citizens of the United States, who are quite competent to decide them without obtrusive advice. But it will be evident that their decision may exercise a far-reaching influence upon the manufacture of chemicals throughout the world. Doubtless American manufacturers have for several years past been heavily handicapped in their operations, as compared with continental European manufacturers, who have had an untrammeled supply of duty-free spirit, or even with British manufacturers working under some restriction. This disadvantage has been so great, that notwithstanding the high existing protective duties it has been possible some-

times to beat Americans out of their own markets. But it will hardly be consistent with the reputation of United States enterprise if such a condition of affairs survives either a partial or a total abolition of the spirit duty; indeed we should rather expect to find that the European manufacturers are encountering fresh and vigorous rivals in the other markets of the world.

At the annual meeting of the Pharmaceutical Society of Victoria last month it was resolved to take advantage of the passing of a "Companies' Statute" recently, "for the registration of scientific and literary associations and societies," to incorporate and register the Society under the title of the "Pharmaceutical Society of Australasia." In virtue of this registration the Society will become a body corporate, with perpetual succession, just as if it were incorporated by Royal Charter or by an Act of Parliament, and will be able to hold property in its own name without the intervention of trustees. Speaking upon this subject in his annual address, and evidently referring to the more inclusive range of the new title, the President expressed an opinion that under the new constitution, with its wide scope, there was no reason why the Society should not, in a few years, occupy a position as high and important as that of the Pharmaceutical Society of Great Britain. We hope the anticipation may be verified.

* * *

A few weeks ago we mentioned (before, p. 675) that the New Zealand Government had issued an Order in Council requiring that every retail sale of strychnia or arsenic should be preceded by the production by the purchaser of a statutory declaration as to the purpose for which the poison was required, and that a meeting of pharmacists to discuss the subject was to be held in Dunedin. We learn now that as the result of a representation by the Pharmacy Board the Order has since been withdrawn. When the fact was brought under the cognizance of the colonial Premier that as a consequence of the Order the payment of half-a-crown stamp duty and the services of a justice of the peace had become the indispensable preliminaries to the purchase of a shillingsworth of poison the absurdity of the position was admitted and the obnoxious order cancelled.

* * *

We have received a copy of the first part of a new quarterly journal, entitled 'Drugs and Medicines of North America,' which is to be "devoted to the historical and scientific discussion of the botany, pharmacy, chemistry and therapeutics of the medicinal plants of North America, their constituents, products and sophistications," and will be conducted by Messrs. J. U. and C. G. Lloyd, of Cincinnati. The plants treated of in this part are *Clematis virginiana*, *Thalictrum dioicum*, *Thalictrum anemonoides*, *Anemone nemorosa* and *Anemone patens*, all Ranunculaceous plants, from which it would appear that there is an intention to proceed by natural orders. The work is freely illustrated with well-executed uncoloured drawings of the plants and parts of them, as well as diagrams showing their microscopical structure, and bids fair to be a most valuable addition to the literature of the materia medica.

* * *

In reviewing the subject of pulsatilla, Messrs. Lloyd state that the United States *Anemone patens*, var. *Nuttalliana*, is so nearly like the foreign allied species that there is no reason why the future supply of the drug for that country should not be derived from the native plant, especially as the European species collected for medicinal use differ from each other as widely as from the variety of the species indigenous to America.

* * *

The new number of *The Asclepiad* contains a variety of interesting articles, and among them a paper, by Dr. Richardson, on John Keats, who is claimed as "an Esculapian poet." The paper is illustrated by a beautifully executed portrait of the poet in his twenty-third year, the original picture from which it is taken being in the possession of Mr. Buxton Forman.

* * *

In a paper recently read before the Hygienic Society of Berlin, Herr Miller reported the results of his endeavours to determine the nature of the ferment occurring in the mouth to which he is disposed to attribute the setting up of caries in the teeth. He stated that he had found the ferment to exist in the saliva and that it appeared to result from the growth of two forms of lactic acid fungi, which may prove to be reducible to a single species. In comparative tests as to the agents best suited to stop the development of the organisms and the consequent formation in the mouth of acid, to the action of which on the enamel of the teeth he considers the caries to be due, he found that a solution of corrosive sublimate, 1 in 500,000, checked the formation of acid, and a solution of 1 in 100,000, completely destroyed the organisms. He therefore thinks that a solution of corrosive sublimate, not strong enough to be dangerous, would be found a very effective mouth wash. The spores of the organisms were found to remain capable of development after an hour's boiling in a solution of meat extract. The organisms were also destroyed by solution of potassium permanganate, 1 in 1000; solution of carbolic acid, 1 in 500, and salicylic acid, 1 in 125, whilst the development of acid was checked by solutions of half these strengths.

* * *

The tariff law of the United States has provided still another nut for the superior officials to crack. A dispute appears to have arisen in respect to the essential oil of bitter almonds, which the importers claim to be covered by the term "almond oil," and therefore to be on the free list, whilst the custom house "appraiser" holds that it is liable to pay an import duty of 25 per cent. as an essential oil.

* * *

The next meeting of the Society of Chemical Industry will be held on Monday next, May 5, at 8 p.m., in the Chemical Society's Rooms, Burlington House. The papers to be read are: "On the Composition and Illuminating Power of Coal Gas," by Dr. Percy Frankland; and "On the Estimation of the Illuminating Power of Gas Burners, especially those of large size," by Mr. W. J. Dibdin.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, May 7, at 9 p.m., when a paper on "Tartar Emetic" will be read by Mr. C. Thompson.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

April 16, 17, 18, 23, 24 *and* 25, 1884.

Present on the 16th, 17th and 18th—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Southall, Tanner, Taylor and Thresh.

Present on the 23rd and 24th—Mr. Carteighe, President; Mr. Atkins, VicePresident; Messrs. Barnes, Benger, Brady, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Southall, Tanner, Taylor and Thresh.

Present on the 25th—Mr. Carteighe, President; Mr. Atkins, VicePresident; Messrs. Barnes, Benger, Brady, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Southall, Tanner, Taylor and Thresh.

Dr. Greenhow attended on the 17th, 18th, 23rd, 24th and 25th, on behalf of the Privy Council.

MAJOR EXAMINATION.

16*th.*—*Eight* candidates were examined. *Three* failed. The undermentioned *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Ashton, Frederick William .. Market Harborough.
Cule, Taliesin .....Merthyr Tydvil.
Dobson, George Turner .....Holsworthy.
Granger, Harold .....Nottingham.
Neve, Annie.....London.

23*rd.*—*Seven* candidates were examined. *One* failed. The undermentioned *six* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Jones, Morgan Isaac .....Aberdare.
Luxmoore, Charles Mann .....Bristol.
Marshall, Sam .....Hyde.
Milford, James Emery .....Bath.
Spilsbury, James .... Stafford.
Wood, John .....Leighton Buzzard.

MINOR EXAMINATION.

16*th.*—*Twenty-one* candidates were examined. *Fifteen* failed. The undermentioned *six* passed, and were declared qualified to be registered as Chemists and Druggists:—

Atherton, Henry Charles .....Tunbridge Wells.
Atkinson, William George.....Ulverston.
Blyton, Thomas Bage .....Manchester.
Burgess, Thomas .....Liverpool.
Callaway, George Frederic.....Ipswich.
Dunn, George Marchant.....London.

17*th.*—*Twenty-seven* candidates were examined. *Eighteen* failed. The undermentioned *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Carter, Benjamin..... .....Falmouth.
Chifney, George Pearmain .....Mildenhall.
Deck, Arthur Albert ....Cambridge.
Dunn, Isaac George.....Chard.
Eastes, Ernest John.....Deal.
Edgar, Frederick George.....Southsea.
Evans, Daniel Thomas .....Llandyssul.
Fowle, Sydney .....London.
French, Herman .....Milton next Gravesend.

18*th.*—*Twenty-six* candidates were examined. *Fifteen* failed. The undermentioned *eleven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Freshney, John Wm. Septimus.Lincoln.
Golding, Frank Oliver... .....London.
Groves, Thomas .....Bridport.
Hacon, Elizabeth Constance ...London.
Hall, Reuben .....Bath.
Hallawell, Joseph Lefebore ...Ayr.
Hare, George Edward.....Nottingham.
Harrison, Thomas .....Birmingham.
Hickley, Arthur Mackenzie ...London.
Hodgson, George .....Doncaster.
Hudson, Thomas Herbert .....Leeds.

23*rd.*—*Twenty-two* candidates were examined. *Fifteen* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Jenkins, Thomas .....Aberdare.
Lewis, Thomas.....Llagain.
McDiarmid, Fraser .....Deal.
Madge, Thomas William .....Shaldon.
Marlar, John Frederick .....Halstead.
Mathias, James Russell Hy. ...Tenby.
Smith, Albert .....Stalybridge.

24*th.*—*Twenty-five* candidates were examined. *Sixteen* failed. The undermentioned *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Moss, Thomas Abbot .....Carlisle.
Owen, John .....Sheffield.
Paul, Ernest .....Windsor.
Pierce, Robert Wynne Charles.Bangor.
Ridley, Henry .....Ipswich.
Roberts, Robert .....Llangynidr.
Russell, Harry Edward .....London.
Smith, Joseph De Carle .....Norwich.
Taylor, John Williams .....Norwich.

25*th.*—*Twenty-five* candidates were examined. *Fifteen* failed. The undermentioned *ten* passed, and were declared qualified to be registered as Chemists and Druggist:—

Scholes, William Isaac .....Pendleton.
Skoulding, William George ...Oakham.
Spurway, Edgar .....Kidderminster.
Stewart, Robert McAll .....Penryn.
Sutcliffe, John Arthur.....Halifax.
Tennant, Alfred .....Lancaster.
Timbury, Alfred Jeffries.....Leominster.
Tugwell, Ernest Harry .....Greenwich.
Verdon, Levinons .....Knighton.
Worfolk, Alfred Egbert .....Knottingley.

MODIFIED EXAMINATION.

16*th.*—*One* candidate was examined, and was declared qualified to be registered as a Chemist and Druggist:—

Bassett, John .....Leominster.

PRELIMINARY EXAMINATION.

25*th.*—The undermentioned certificates were received in lieu of the Society's examination:—

Certificate of the College of Preceptors.

Allin, Charles James .....St. Albans.

Certificate of the University of Aberdeen.

Farquharson, Alex. McDonald.Aberdeen.

Certificates of the University of Cambridge.

Emery, Alfred .....London.
Fuge, Harry Dixon .....Matlock Bath.
Minter, Albert Edward .....Balham.

Certificate of the University of London.

Barclay, John .....Birmingham.

Certificates of the University of Oxford.

Roberts, Thomas .....Llanfyllin.
Stubbs, Frederick.....Birkenhead.
Wynne, William Arthur.....Mold.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting was held in the Institute Room, Shakespeare Street, on Friday evening, April 25. In the unavoidable absence of the President, through illness, the chair was occupied by Mr. Wilford, Vice-President.

There was hardly such a good attendance as usual.

The Secretary, Mr. C. A. Bolton, read the reports received from Professor Clowes, D.Sc., F.I.C., of the Pharmaceutical Chemistry Class, held at the University during the past winter; it was of a most satisfactory character, 50 per cent. of the candidates who presented themselves for examination having succeeded in satisfying the examiner.

Mr. Major, B.A., F.R.G.S., B.Sc., then delivered a most instructive and interesting lecture upon "Epidemics." An epidemic was defined as a disease attacking a large number of people and being spread by infection. It was distinguished from an endemic by the latter being confined to one place, as the malaria around Rome and the leprosy of the Sandwich Islands. Epidemics are produced by germs, the largest of which are not more than $\frac{1}{6000}$th of an inch in diameter. The difference of philosophers as to the source of these germs was mentioned. On the one side, Pasteur, Huxley and Tyndall, hold that they must be produced by pre-existing life; the other side (Bastian and others), that they may be produced from inorganic substances; the experiments by which they arrived at their conclusions being pointed out and explained. The lecturer then alluded to the folly of people being careless of catching such diseases as scarlatina on the grounds "we shall have to take it some time and the sooner the better." Nothing could be more erroneous or misleading, as less than 50 per cent. of the population ever have these diseases at all and the greatest fatality is amongst young children from one to five years old, for this reason, these germs attack the mucous membrane and this, in children, is very delicate and most susceptible to their influence. Consumption was treated of and the new remedies of inhalation recently brought into prominence by the faculty explained. It was also remarked that consumption occurred much less on mountain tops and at the sea side, on account of the large amount of ozone present in the atmosphere. Statistics were alluded to to show that consumption increases with the density of population per square mile. Methods of propagating the disease were treated in detail. Garments and woollen fabrics so very often proving means of carrying the germs from one part to another, reason urged that the safest and best course was to destroy them. The lecturer then gave some most potent arguments in favour of cremation, urging that quick decay was much better than the present slower one. The reason why milk is such a very suitable medium for carrying disease germs was explained to arise from the fact that it is of such a character as to be one best suited for increasing the number of germs to a rapidly alarming extent as well as at the same time increasing their activity.

A most cordial vote of thanks was passed to the lecturer on the motion of Mr. W. H. Parker, seconded by Mr. A. Middleton.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

Some New Optical Instruments and their Arrangements.

On Monday, the 28th ult., the first of two Cantor lectures upon "Some New Optical Instruments and their Arrangements" was delivered by Mr. J. Norman Lockyer. He commenced the lecture by stating three rather startling facts: that there is at present no manufactory of optical glass in England; that, as far as he knows, there is only one such manufactory in the world; and that it will most probably be closed within a period of six months. Two centuries ago it was considered almost impossible to construct a telescope for the purpose of taking astronomical observations, owing to the great focal length of the lens; the minimum focal length being about 100 feet, the expense of mounting must have been enormous. Hooke had avoided the necessity of shifting the telescope in order to obtain views of different celestial bodies, by the construction of a movable mirror, with which light could be thrown into the telescope from any point in the heavens; this idea, however, remained dormant till 1869. Two discoveries about that time led to its application. Liebig found that it was possible to add a film of silver to the polished surface of glass, by means of the admixture of two solutions, one consisting of nitrate of silver and ammonia, the other of nitrate of silver and Rochelle salt; Fougot at the same time was able to construct a perfect optical plane on geometric principles. During the lecture Mr. Norman Lockyer remarked upon the custom of opticians making mirrors thin, as being less affected by temperature. He was himself of opinion that the thickness of small mirrors should be about one-fifth of their diameter, but should be reduced to one-seventh when of a large size. As to weight he considered that a mirror of 5 feet in diameter and one-seventh the thickness should weigh about a ton. Remarking that up to the present no means had been contrived to enable telescopic observations of the stars to be taken with comfort, and at the same time allow of a view of every part of the sky, the lecturer mentioned that two movable domes are in the course of construction in Paris with this object, the larger one having a diameter of rather over 60 feet. They are hemispherical in shape, and the principal material used in their construction steel. The machinery is so arranged as to allow not only the dome and telescope, but also the observer's chair to move in unison; a circular rim floating in a trough supports the whole dome, and so slight is the friction that it may be easily turned by a child. The liquid used as the floating medium consists of a solution of magnesium chloride of a certain density, which freezes at - 35° C., and does not attack the galvanized iron of which the trough and rim are constructed. Should this floating system fail the dome would only fall 1 or 2 millimetres and would then be worked by an ordinary circular railway. The great drawback to this arrangement is the expense of the structure of the dome, which amounts to three times that of the telescope. The lecturer himself favoured an instrument invented by M. Laville, which he considered gave better results. This instrument mainly consists of a telescope, bent about the middle at an angle of 90°, the light being reflected by a mirror placed in the right angle; another movable mirror, at the extreme end of the telescope, enables observations to be taken of stars in different meridians, whilst the telescope can itself be moved to obtain views of the equatorial stars, thus ensuring views of all parts of the sky without the necessity for a "finder." An objection has been raised to this instrument on account of the loss of light arising from the double reflection of the mirrors, and consequently a loss of definite view, but Mr. Lockyer states that this loss, if at all appreciable, could be remedied by a slight enlargement of the aperture

Parliamentary and Law Proceedings.

The Ontario Pharmacy Act, 1884.

ASSENTED TO MARCH 25, 1884.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as "The Pharmacy Act, 1884."

2. The Ontario College of Pharmacy, incorporated by the Act passed in the thirty-fourth year of Her Majesty's reign, and chaptered 34, is hereby continued.

3. The Ontario College of Pharmacy shall have power to acquire and hold real estate, not exceeding at any time in annual value five thousand dollars, and the same, or any part thereof, may alienate, exchange, mortgage, lease, or otherwise charge or dispose of as occasion may require, and may erect buildings for the purpose of accommodating lecturers on chemistry or pharmacy, or for a library, pharmaceutical museum, or specimen room for the use of the members and associates of said College; and all fees payable under this Act shall belong to the said College for the purposes of this Act.

Pharmaceutical Council.

4. There shall be a Council of said College, to be called the Pharmaceutical Council, which shall consist of thirteen members, who shall be elected as hereinafter provided, and shall hold office for two years, and the said Council shall, subject to the laws thereof, have sole control of the real and personal property of the College, and have authority to grant certificates of competency to conduct the business of a chemist or druggist, and to be registered subject to the provisions of this Act.

5. Any member of said Council may at any time resign by letter directed to the registrar of said College: and in the event of any vacancy occurring, the remaining members of the Council shall fill up such vacancy from the members of the College.

6. An election of members of the said Council shall be held on the first Wednesday in July in every second year, and the persons qualified to vote at such election, shall be such persons as are members of the said College.

7. The Council shall, at their first meeting, elect from among themselves a president and vice-president, and shall appoint a registrar and such other officers as the said Council may consider necessary.

Certificates of Competency.

8. The said Council shall hold at least two sittings in every year, on the first Wednesday in February and first Wednesday in August, for the purpose of granting certificates of competency, at such places as they may by resolution appoint, of which due notice shall be given for at least one month in the *Ontario Gazette*, and at least two newspapers in the City of Toronto.

9. The Council of the said College shall, subject to the supervision and disallowance thereof by the Lieutenant-Governor in Council, have authority to prescribe the subjects upon which candidates for certificates of competency shall be examined, to establish a scale of fees not to exceed 10 dollars, to be paid by persons applying for examination; and to make bye-laws, rules and orders for the regulation of their own meetings and proceedings, and those of the College; and for the remuneration and appointment of examiners and officers of the said College; and for the payment of remuneration or indemnity to the members of the said Council in attending its sittings, or in attending upon the business of the said College; and in respect to any other matters which may be requisite for the carrying out of this Act; provided always, that no more than 5 cents per mile for travelling expenses, or more than 4 dollars per day for such days only as he shall be in actual attendance upon the business of the College, including going to and returning from such sitting, be allowed to any member for such expenses and remuneration.

10. The examinations of the College may be conducted by the members of the Council, or by persons appointed by them.

Who may apply for Certificates.

11. Subject to the rules, regulations and bye-laws of the Ontario College of Pharmacy, the following persons and no others may be admitted as candidates for certificates of competency:

(*a*) Any person who shall furnish to the Council of the said College satisfactory evidence of having, in pursuance of a binding contract in writing for that purpose, served as an apprentice to a regularly qualified pharmaceutical chemist for a term of not less than three years.

(*b*) In case any person who has apprenticed himself as aforesaid, shall by reason of the death, failure in business, or removal of his employer, or from any other cause satisfactory to the said Council, be unable to complete his apprenticeship with such employer, such person shall be at liberty, when and as often as this may happen, to enter into a new contract to complete the remainder of his unfulfilled term with any other regularly qualified pharmaceutical chemist.

(*c*) Nothing in this section shall apply to any person who had, prior to the passing of this Act, begun his apprenticeship with a regularly qualified pharmaceutical chemist without such binding contract in writing.

Preliminary Examinations.

12. Every person who may hereafter be desirous of becoming apprenticed as aforesaid, shall, before the term of his apprenticeship begins to run for the purpose of this Act, furnish to the registrar of the College a certificate or other evidence satisfactory to the Council, showing that prior to the commencement of such apprenticeship he had passed an examination entitling him to admission to a high school, college, collegiate institute, or to the fourth form of a public school for the Province of Ontario; provided that apprentices who have commenced their apprenticeship out of the Province shall give satisfactory evidence of having had equal qualifications to the aforesaid at the time when their apprenticeship was entered upon.

Registration.

13. It shall be the duty of the registrar to make and keep a correct register, in accordance with the provisions of this Act, as shown in schedule "B," of all persons who may be entitled to be registered under this Act, and to enter opposite the names of all registered persons who have died, a statement of such fact, and from time to time to make the necessary alterations in the addresses of persons registered under this Act, and shall cause to be printed and published on or before the fifteenth day of June of each year, an alphabetical list of the members who were on the first day of June of that year entitled to keep open shop as pharmaceutical chemists.

14. Any person having passed such examination as aforesaid to the satisfaction of the Council, shall be entered upon the roll of registered chemists and druggists and shall become a member of the College.

15. All persons who, on the fifteenth day of February, 1871, were in business as chemists and druggists, or chemists, druggists, or apothecaries, upon their own account, or in partnership with any other person, or who had before said day served an apprenticeship of three years, and acted as a druggist's assistant for one year, shall be entitled to be registered under this Act, upon production to the registrar of such evidence of their having been so engaged, as the Council of the said College may require, and upon payment of a registration fee of 10 dollars; provided, that applications for such registration be made within twelve months from the passing of this Act.

16. No name shall be entered in the register except of persons authorized by this Act to be registered, nor

unless the registrar is satisfied by proper evidence that the person claiming is entitled to be registered; and any appeal from the decision of the registrar may be decided by the Council of the said College, and any entry proved to the satisfaction of the Council to have been fraudulently or incorrectly made, may be erased from or amended in the register by order of the Council.

17. Upon any person being registered under this Act, he shall be entitled to receive a certificate in the form of schedule "D" or to the like effect, under the corporate seal of the said College, and signed by the registrar.

18. There shall be payable to the registrar of the said College, for the uses of the College, on the first day of May of each year, by every person registered and carrying on business as a pharmaceutical chemist, the sum of 4 dollars; provided that in case such person shall carry on such business in more than one locality, the further sum of 4 dollars shall be payable by him, as aforesaid, for each such additional place of business, and provided also, that all employees or assistants who manage or have charge of such additional places of business, shall be legally qualified pharmaceutical chemists.

19. Any person registered under this Act, and no other person, shall be entitled to be called a pharmaceutical chemist, and no other person except a pharmaceutical chemist, as aforesaid, or his employee or employees, shall be authorized to compound prescriptions of legally authorized medical practitioners; but no person shall be entitled to any of the privileges of a pharmaceutical chemist, or member of the said College, who is in default in respect to any fees payable by him by virtue of this Act.

20. Upon a resolution of the Council of the said College being passed, declaring that any person in consequence of his conviction for any offence or offences against this Act, is, in the opinion of the Council, unfit to be on the register under this Act, the Lieutenant-Governor in Council may direct that the name of such person shall be erased from such register, and it shall be the duty of the registrar to erase the same accordingly.

21. Every pharmaceutical chemist carrying on business on his own aocount shall display his certificate in a conspicuous position in his place of business.

22. Every person having been registered under this or any former Act, as a pharmaceutical chemist, shall, on retiring from business as such chemist, give the registrar notice in writing of the same, and in default thereof he shall remain liable for his annual registration fee; provided, that it shall be lawful for any such person to resume the business of chemist and druggist at any time after retiring therefrom as aforesaid, upon giving notice in writing to the registrar of the College of his intention so to do, and upon payment to him of the then current annual registration fee.

Preparation of Compounds.

23. All compounds named in the British Pharmacopœia shall be prepared according to the formula directed in the latest edition published "by authority" unless the College of Physicians and Surgeons of this Province select another standard, or unless the label distinctly shows that the compound is prepared according to another formula.

Sale of Poisons.

24. No person shall sell or keep open shop for retailing, dispensing, or compounding poisons, or sell or attempt to sell any of the articles mentioned in schedule "A" to this Act, or assume or use the title of "chemist and druggist," or "chemist," or "druggist," or "pharmacist," or "apothecary," or "dispensing chemist," or "druggist," in any part of the Province of Ontario, unless such person is registered under this Act, and unless such person has taken out a certificate under the provisions of section 18 of this Act, for the time during which he is selling or keeping open shop for retailing, dispensing, or compounding poisons, or assuming or using such title; provided, that nothing in this Act contained shall be taken to prevent the sale, by persons not registered in pursuance of this Act, of Paris green, London purple, and other arsenical insecticides, so long as such articles are sold in well secured packages distinctly labelled with the name and address of the seller and marked "Poison," and a record of such sales is kept as required under the provisions of this Act.

25. The several articles named or described in schedule "A," shall be deemed to be poisonous within the meaning of this Act, and the Council of the Ontario College of Pharmacy, hereinbefore mentioned, may from time to time by resolution declare, that any article in such resolution named ought to be deemed a poison within the meaning of this Act, and thereupon the said Council shall submit the same for the approval of the Lieutenant-Governor in Council, and if such approval is given, then such resolution and approval shall be advertised in the *Ontario Gazette*, and on the expiration of one month from such advertisement the article named in such resolution shall be deemed to be a poison within the meaning of this Act, and the same shall be subject to the provisions of this Act, or such of them as may be directed by the Lieutenant-Governor in Council.

26. No person shall sell any poison named in the first part of schedule "A" either by wholesale or retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained is distinctly labelled with the name of the article and the word "poison," and if sold by retail, then also with the name and address of the proprietor of the establishment in which such poison is sold; and no person shall sell any poison mentioned in the first part of schedule "A" to any person unknown to the seller unless introduced by some person known to the seller; and on every sale of any such article the person actually selling the same shall, before delivery, make an entry in a book to be kept for that purpose, in the form set forth in schedule "C" to this Act, stating the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, the purpose for which it is stated by the purchaser to be required, and the name of the person, if any, who introduced him, to which entry the signature of the purchaser shall be affixed.

Offences and Penalties.

27. No person shall wilfully or knowingly sell any article under the pretence that it is a particular drug or medicine which it is not in fact, and any person so doing (besides any other penalties to which he may be liable) shall be subject to the penalties prescribed by section 28 of this Act.

28. Any person transgressing any of the provisions of this Act, or selling any poison in violation thereof, shall for the first offence incur a penalty of 20 dollars and costs of prosecution, and for each offence committed subsequent to such conviction, a penalty of 50 dollars and costs of prosecution, to be recovered in a summary manner, before one or more justices of the peace or police magistrate, on the oath of one or more creditable witnesses, one moiety to belong to the prosecutor and the other to be paid to the registrar for the use of the College.

29. In any prosecution under this Act it shall be incumbent upon the defendant to prove that he is entitled to sell or keep open shop for compounding medicines or retailing poisons, and to assume the title of Chemist and Druggist, or other title mentioned in section 24 of this Act, and the production of a certificate purporting to be under the hand of the registrar and under the seal of the said College, showing that he is so entitled, shall be *primâ facie* evidence that he is so entitled.

30. No person selling articles in violation of the provisions of this Act shall recover any charges in respect thereof in any Court of Justice.

Act not to affect Medical Practitioners.

31. (1) Nothing in this Act contained shall extend to or interfere with the privileges conferred upon legally qualified medical practitioners by any of the Acts relating to the practice of medicine and surgery in this Province, and they may be registered as pharmaceutical chemists without undergoing examination; nor shall anything in this Act prevent any person whatsoever from selling goods of any kind to any person legally authorized to carry on the business of an apothecary, chemist and druggist, or the profession of a doctor of medicine, physician or surgeon, or veterinary surgeon, nor prevent the members of such professions supplying to their patients such medicine as they may require, nor interfere with the business of wholesale dealers in supplying poisons or other articles in the ordinary course of wholesale dealing.

(2) Nothing in this Act shall prevent any member of the College of Physicians and Surgeons of Ontario from engaging in and carrying on the business of an apothecary, chemist, or druggist without registration, under the provisions of this Act.

32. Upon the decease of any person legally authorized and actually carrying on the business of chemist and druggist at the time of his death, it shall be lawful for the executor, administrator or trustee of the estate of such person to continue such business if and so long only as such business is *bonâ fide* conducted by a pharmaceutical chemist registered under this Act, provided such executor, administrator or trustee continues to pay the annual registration fee of 4 dollars.

Honorary Members.

33. It shall be competent for the Council of the said College to elect as honorary members such persons as may be eminent for their scientific attainments; but such honorary members shall not as such be entitled to vote at elections or carry on the business of pharmaceutical chemists.

34. All persons approved of by the Council of the said College, who hold diplomas from the Pharmaceutical Society of Great Britain, or certificates from any pharmaceutical college in the Dominion of Canada or elsewhere, may be registered as members of the Ontario College of Pharmacy without the examination prescribed by this Act.

35. The Pharmacy Act, chapter 145 of the Revised Statutes of Ontario, is hereby repealed.

Schedule "A."

(*Secs.* 24, 25 *and* 26.)

PART I.

Acid, hydrocyanic (prussic).
Aconite and compounds thereof.
Antimony, tartrate of.
Arsenic, and all the compounds thereof.
Atropine.
Conia, and the compounds.
Corrosive sublimate.
Digitaline.
Ergot.
Hemp, Indian.
Morphia, and its salts and solutions.
Oil, cedar.
Strychnine, and nux vomica.
Savin and preparations of.
Varatria.

PART II.

Acid, oxalic.
Belladonna and the compounds thereof.
Beans, Calabar.
Cantharides.
Carbolic acid.
Chloral hydrate.
Chloroform and ether.
Conium, and the preparations thereof.
Croton oil and seeds.
Cyanide of potassium.
Euphorbium.
Elaterium.
Goulard's extract.
Hyoscyamus and preparations.
Hellebore.
Iodine.
Opium with its preparations, including laudanum, etc., but not paregoric.
Pink root.
Podophyllin.
Potassium, iodide of.
Potassium, bromide of.
St. Ignatius' beans.
Santonine.
Scammony.
Stramonium and preparations.
Valerian.
Verdigris.
Zinc, sulphate of.

Schedule "B."

(*Sec.* 13.)

Name.	Residence.	Qualification.	Remarks.
A.B.	Kingston.	In business for three years prior to Feb. 15, 1871.	Dead.
C.D.	Hamilton.	Examined and certified, July 12, 1871.	Erased by order of the Lieut.-Governor, dated October 14, 1875.
E.F.	London.	Served apprenticeship and as assistant.	

Schedule "C."

(*Sec.* 26.)

Date.	Name of purchaser.	Name and quantity of poison sold.	Purpose for which it is required.	Signature of purchaser.	Address of purchaser.	Name of person introducing purchaser.

Schedule "D."

(*Sec.* 17.)

I hereby certify that *C. D.* having first passed the examination prescribed by the Pharmaceutical Council, *or* having on the 15th day of February, 1871, been in business as Chemist and Druggist on his own account, *or* having, prior to the 15th day of February, 1871, served an apprenticeship of three years and acted as druggists' assistant for one year (*as the case may be*), was on the day of duly registered as a Pharmaceutical Chemist, and is authorized to carry on the business of Chemist and Druggist in the Province of Ontario, from the day of A.D. 18 to the day of

(Signed)

E. F.,

Registrar of the Ontario College of Pharmacy.

[Corporate Seal.]

CRIMINAL POISONING WITH STRYCHNINE.

At the Newcastle Spring Assizes, on Saturday last, before Mr. Justice Hawkins, Sarah Jane Holmes was charged with feloniously killing and murdering John Holmes Burns. It appeared from the evidence that the prisoner had been living with a man called Burns, and during that time went under his name. The man having left her she seems to have enticed his little boy to her home and administered strychnine to him, taking some herself at the same time. The child died shortly afterwards. The following is the evidence given as to the purchase of poison by the prisoner:—

Robert Stobbs said he was a chemist carrying on business at 26, Sackville St., North Shields. On Mar. 1 the prisoner came to his shop and asked for a packet of vermin-killer. He asked her name, and she told him it was Mrs. Burns. She signed the book "Nance Burns, 38, Church Way." The vermin-killer was a powder he prepared himself. It

contained strychnine, about 14 per cent. of the whole. The weight of the packet he sold her was 12 grains.

Cross-examined: She told him she wanted it for killing mice.

James Williamson said he was a chemist, and carried on business at 11, Union Street, North Shields. The prisoner came to his shop on March 25, last, and asked for a 6*d.* packet of Battle's vermin-killer, with which she was supplied. He made an entry of the sale in the poison book in the name and address of the prisoner, "Nance Burns, 38, Church Way." The packet was labelled "Poison." On the 17th ult. he supplied Detective John Riddell with a packet of the vermin killer, which was, externally, precisely the same as that sold to the prisoner.

Peter C. Reid said he was an apprentice to Mr. J. F. Hogg, chemist, Tyne Street. He remembered prisoner coming to the shop on April 1, and asking for a 6*d.* packet of Battle's vermin killer. On being supplied with a packet she signed the name "Nance Burns, 38, Church Way."

The prisoner was convicted and sentenced to death.

Obituary.

JOHN CHARLES BRAITHWAITE.

Many of our readers will learn with the regret due to personal acquaintance of the death at Twickenham, on Wednesday last, of Mr. John Charles Braithwaite, at the age of sixty years, after an illness lasting only a few days.

Mr. Braithwaite was born near Hereford, and served his apprenticeship to the General Apothecaries' Company of Liverpool, where he afterwards remained as assistant-chemist. He entered as a student in the School of Pharmacy, Bloomsbury Square, in the session 1847–48. He passed the Major examination in 1848, and afterwards succeeded to the post of demonstrator in the Society's laboratory, an office he discharged until 1860. After this he was, for a short time, chemist to the General Apothecaries' Company, of Berners Street, but in 1862 he gave up this post and devoted the whole of his time to teaching until the year 1877, when his failing health compelled him to relinquish this vocation. In consequence of this his means were much reduced, and this having become known to his friends he was nominated for election as an annuitant of the Benevolent Fund, and was elected in 1877.

Although no longer taking an active part in pharmacy Mr. Braithwaite's interest in the calling with which he had been so long connected continued, and the memory of the kindness he had received from many of his old pupils was preserved to the last.

Notice has also been received of the death of the following:—

On the 13th March, Mr. Samuel Kirkpatrick, Chemist and Druggist, East Reach, Taunton. Aged 56 years.

On the 5th April, Mr. James Edmunds, Chemist and Druggist, Newport, Mon. Aged 43 years.

On the 10th April, Mr. George Starke, Chemist and Druggist, Reading. Aged 78 years.

On the 14th April, Mr. William Eddie, Chemist and Druggist, Aberdeen, Aged 58 years.

On the 20th April, Mr. William Fleming Grayson Benson, Chemist and Druggist, Liverpool. Aged 55 years.

On the 20th April, Mr. Thomas Walton, Chemist and Druggist, Stanhope. Aged 62 years.

On the 21st April, Mr. William Henry Cuthbert, Chemist and Druggist, Willesden. Aged 54 years.

On the 23rd April, Mr. Robert Tully Watkins, Chemist and Druggist, Oxford. Aged 40 years.

On the 24th April, Mr. Joseph Bradley Shillcock, Pharmaceutical Chemist, Bromley. Aged 71 years. Mr. Shillcock had been a Member of the Pharmaceutical Society since 1842.

On the 26th April, Mr. Joseph Johnson, Chemist and Druggist, The Pavement, Merton. Aged 54 years. Mr. Johnson had been a Member of the Pharmaceutical Society since 1872.

On the 28th April, Mr. Edward Percival Guest, Pharmaceutical Chemist, Brentwood, Essex. Aged 56 years. Mr. Guest had been a Member of the Pharmaceutical Society since 1865.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Spirit of Nitrous Ether.

Sir,—I observe a letter on the above subject from Mr. A. C. Abraham, which demands some notice, though its tone certainly cannot be commended. Passing over the preliminary sneer regarding "the source of these papers," and leaving Professor Hay and Mr. MacEwan to look after themselves, I shall refer to those points which more directly concern myself.

Now, I should at once express my sincere regret if I had misrepresented Mr. Abraham's views, but I do not find I have said anything meriting such a positive contradiction as he gives. Mr. Abraham's words are these—"He [Mr. Rimmington] forgets that acetates are *known* to do what he only suggests as a function of the nitrous acid and so fails to appreciate the value of the aldehyde, which we may fairly assume will be converted into acetic acid and afterwards into an acetate *when it reaches the blood*; where its action is required. I believe we have as much right to say that aldehyde is the active ingredient as to credit nitrite of ethyl with being such." This is just the opinion which I wish to condemn. Nitrites are powerfully diuretic; acetates are not; yet we are asked to believe that a minute amount of aldehyde may be the source of the physiological activity of spirit of nitrous ether. Mr. Abraham now believes that "the activity is probably due to some polymeric form of aldehyde, such as paraldehyde or some nitro compound of it." What grounds have we for such a supposition? The fact is, Mr. Abraham "believes" and "imagines" a great deal too much.

Regarding the next paragraph in Mr. Abraham's letter, I can only say that it is sheer nonsense, as there can be no doubt that acetic acid is absorbed into the blood from the stomach; while to take *oxymel scillæ* as an example of the diuretic action of acetic acid is peculiarly foolish. Mr. Abraham proceeds to say—"With regard to the process finally adopted by Mr. Dott for the estimation of nitrous ether, he will find that I suggested at Southport practically the same thing; but I omitted the acid as unnecessary, because the preparation contains something (not aldehyde, because that is not present in sufficient quantity) which so decomposes as to render the acid unnecessary. This something, which Mr. Dott entirely ignores, but which *I believe to be more probably* [the italics are mine] the chief ingredient wanted, is consequently so far estimated at the same time." I plead guilty to having ignored "this something," and I cannot comprehend how it is "estimated at the same time." Of one thing I am certain, that "this something" does *not* render the addition of acid unnecessary, unless perhaps the sample itself should be very acid. Possibly "this something" is only another name for *free acid*. I repudiate the idea that I was anticipated in any way by Mr. Abraham at Southport. In my paper, I did not refer to his method of employing iodide of potassium as a test (in which there is nothing new) because any reference could only have been condemnatory. Mr. Abraham then described (not for the first time) a process which is worthless; I have described a process which has at least some value.

David B. Dott.

Spirit of Nitrous Ether.

Sir,—Mr. Abraham, in his letter to the Journal of April 26th, is pleased to comment on two points of my paper on the above subject. On the first point, namely, "Diminution of the Separation Volume," he states that I found a greater loss in two winter months than he found in seven months, chiefly summer. Well, I have to remark on this statement that the loss which I record in specimen *α* was observed after twenty-two days, and in the case of *β* after seven days, not two months as stated by Mr. Abraham, who must have imagiued this period. Moreover, the loss which Mr. Abraham records in his paper ('Year-Book of Pharmacy,' 1883, p. 553) was from "3-4" per cent. when fresh to 3 per cent. at three months, and 2 per cent. at seven months. Specimen *β* of my paper was carelessly stored for the purpose of showing how such conditious affect the quality of the spirit, so that I need not put Mr. Abraham's specimen in comparison with it. But specimen *α* was stored in the best attainable conditions of an ordinary pharmacy, and so kept, the separation volume decreased from 2 per cent. to 1·33 per cent. in twenty-two days; this specimen may fairly be compared with Mr. Abraham's, and by this comparison we find that the difference between 2 and 1·33 is less than that between "3-4" and 2, not greater, as stated by Mr. Abraham. These are small matters, no doubt, but they show that Mr. Abraham is exceedingly careless in his statements of fact.

He is very decided about the second point on which he remarks. He says that he believes my method for determining acidity "to be incapable of accurate results, as decinormal soda solution decomposes sweet spirit of nitre; indeed, any alkali does so more or less rapidly." This statement is a fair index of the manner in which he brings knowledge and wits to bear upon this subject. On this second point he entirely neglects to take into account the elementary chemical fact that during the titratiou the alkali uuites with the free in preference to the combined acid (and this is the very basis of the method), so that decomposition of the nitrous ether, or of the aldehyde, is impossible in the circumstances.

While taking Mr. Abraham's remarks in good part, I cannot avoid expressing the thought that his utterance of inaccurate and misleading criticism is inexcusable and unjustifiable.

In a concluding sentence, I wish to remark that the statement that "any alkali decomposes sweet spirit of nitre more or less rapidly" should rather be written "more or less slowly." (I look upon the statement more as a generally accepted one rather than as an expression of Mr. Abraham.) Thus the U.S.P. allows twelve hours for the saponification of 10 c.c. with 1·5 gram of caustic potash; Dupré allows similar quantities to stand over night, and Muter allows an hour on a water-bath. These all indicate that saponification is slow. I wish, however, to add that it is not complete. Some time ago I allowed a quantity of spirit to remain in contact with large excess of strong soda solution for two days, and then subjected the mixture to distillation and found that all fractions of the distillate up to 100° C. gave the nitrous radicle reactions, and showing, therefore, that the saponification was incomplete. This experiment was undertaken for the purpose of obtaining indicatiou of "paraldehyde," and the odour of the distillate was so similar to that of a spirituous solution of that body as to convey an impression of identity, but the temperature aud the nitrous radicle reactions removed the impression.

Edinburgh. Peter MacEwan.

Standardized Tincture of Nux Vomica.

Sir,—Mr. Smith has correctly indicated an inexact point in the process I advocated for the titratiou of the mixed alkaloids in extract of nux vomica, but the margin of error involved is not great. Dragendorff, my authority, states that each c.c. of the test solution of the strength I recommend precipitates 0·00167 of strychnia, and 0·00197 of brucia. I have satisfied myself of the correctness of this statement as regards strychuia, but as I have no absolutely pure brucia iu my possession, I have beeu obliged to assume that it is equally correct as regards the latter also.

The factor 0·00182 was found in the mean of the two figures above quoted. I was aware it would not yield absolutely correct results when the proportion of one alkaloid greatly exceeded that of the other, but the amount of error as illustiated by the differences shown in the twelve samples quoted in the table (page 443) would be within 0·5 per cent., and I scarcely considered this defect sufficient to outweigh the advantages that attend the process; nevertheless, it is well that attention should be drawn to the fact.

I feel much tempted to reply to Mr. Dunstan's letter in detail, but think on the whole it is better to postpone discussion upon our special points of non-agreement until he has completed and made known the further work on the subject I am so glad to hear he is engaged upon. In the meantime I quote with cordial approval the last sentence of his letter:—

"The production of stan dard galenical preparatious of potent drugs, *which, in the majority of cases, needs the expenditure of a vast amount of preliminary scientific work*, marks out a distinct line of progress and research in the pharmacy of the future. I mean, I think so."

I have taken the liberty of italicizing some very important words in this sentence, and thus read it commends itself to my full approval.

G. F. Schacht.

Extract. Cinchon. Liq.

Sir,—I am delighted that Professor Redwood has taken the ext. cinch. liq. in hand, and heartily concur in his new process. *Apropos* of this matter, I may mention that for several times I have aided the exhaustion of the bark with acid. hydrochlor. dil., by which means an extract was obtained much more satisfactory than the ordinary method, so much so that I now offer the process for what it is worth. The bark is first exhausted with H_2O, only half the quantity the B.P. directs. Then the humid residue is macerated all night iu H_2O with ℥j to 16 bark acid. hydrochlor. dil.; again exhausted, the first percolate evaporated to three ounces. No. 2 percolate is evaporated to a soft extract and this is then macerated in the first 3 ounces, then the whole made up to 4 ounces with s. v. r. A product is obtained doubly bitter to the ordinary aud more deserving of the uame. Suppressing all further comments, I will make bold to say (1st), that Dr. Paul's investigation proved how miserable a preparation the ordinary one is; (2nd), that in dil. acid. hydrochlor. we have an efficient solvent of the alkaloid left behind; (3rd), prolonged heat does not degrade the alkaloid in presence of acid mur., as the whole of the gas is easily dissipated at first; (4th) in a new edition of B.P. the old method ought to be expelled.

31, *Minto Street, Edinburgh.* D. Gorrie.

Hawking Chemists.

Sir,—I notice in your last number an account of a chemist whose man was fined for hawkiug laudanum. It appeared that the chemist was the proprietor of a van from which drugs, etc., were retailed round the country.

It is a fact that many chemists send out carts, which call at every roadside house, and sell everythiug, from tea to paregoric and paraffin. Is it any use for the Pharmaceutical Society to endeavour to raise our trade to a science when the public see educated men sending out drug-carts, only differing from the common hawker in that they emanate from a select dispensing establishment instead of a small huckster's shop?

Such practices prevent the public from looking favourably on efforts that are made to place us somewhat above the mixed grocer: and who can be surprised?

Chemist and Druggist.

Apprentice.—We do not consider the preparation to be hurtful if properly made.

F. Barry.—If you refer to the numbers of the *Pharmaceutical Journal* for the past year you will find some information upon the subject.

T. H. G.—We have not received any report of such a case. You will find information respecting the formula you inquire about in *Pharm. Journal* (1883), pp. 884 and 936.

Communications, Letters, etc., have been received from Messrs. Hemans, Francis, Moir and Son, Franklin, Associate, Datura, Marmor, J.D., F.S.G.

1884 SEASON.

NEW COD-LIVER OIL

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Is a pure and perfectly neutral solid hydrocarbon obtained from Crude Petroleum, devoid of smell and taste. It is of about the consistence of lard, and cannot become rancid.

In 1 pound round tins, at 11d. per pound; in 7, 14 and 28 pound square screw-capped canisters, at 10d. per pound; in 56 and 112 pound square screw-capped canisters, at 9d. per pound.

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A VERY ELEGANT PREPARATION, BRIGHT AND COLOURLESS, AND ENTIRELY FREE FROM SMELL AND TASTE.

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PURE CRUSHED LINSEED

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P.O.O. payable at head office. Bankers, the National Provincial Bank of England.

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The LONDON WHOLE-LEAF TEA For Retail at 1/8.	 18	,,
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The LONDON 3/- TEA For Retail at 3/-.	 62	,,
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Price List and Descriptive Album sent on receipt of post-paid applications.

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A SPECIAL PREPARATION.

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7/ per lb., C. Qts. 6/6, W. Qts. 6/.

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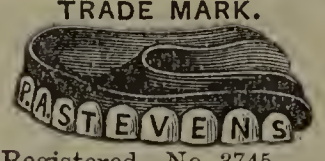

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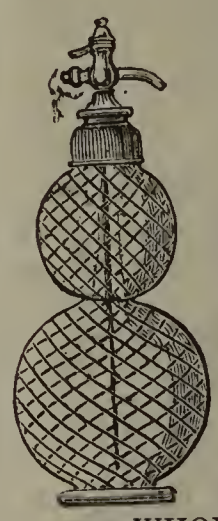

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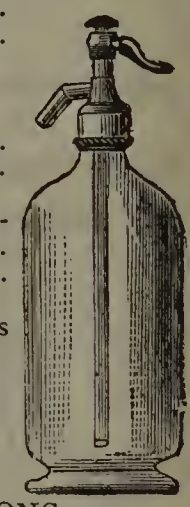

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TESTIMONIAL.

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I am, Gentlemen,
Yours very truly,
M. A. S.

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St. Thomas's Hospital Medical College,
Albert Embankment, S.E.

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Special Classes for the Examinations of the University of London are held throughout the year.

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Prospectus and all particulars can be obtained from the Medical Secretary, Mr. G. Rendle. W. M. ORD, Dean.

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TULLY'S Postal System is the most successful method of preparing without leaving business. Fee—MINOR, One Guinea. PRELIMINARY, 10s. 6d. Send for particulars and *Testimonials* to Mr. J. TULLY (Hills Prizeman), 185, St. George's Rd., West Hill, Hastings. Established 1872. How to Write Equations, 1s.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY.

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

The Lectures and Classes for the June and July examinations have now commenced, but benches can still be secured, or the names of intending students for the new session, which will commence on September 1st, can be received. The principals are desirous of making the fact known that individual teaching is carried out at this School, the success of which has been so frequently shewn.

For Prospectus apply to

Messrs. LUFF & WOODLAND,

173, MARYLEBONE ROAD, N.W.

CONCILIO ET LABORE.

THE MANCHESTER

COLLEGE OF PHARMACY,

225, OXFORD STREET, MANCHESTER.

Three Students from this School (all who entered) passed the Minor at Edinburgh this Month. The undernamed gentlemen have also been successful, viz :—

Minor, London—Mr. ALBERT SMITH, Oldham.
Preliminary—Mr. T. E. GREENHALGH, Blackford.

LIVERPOOL SCHOOL OF PHARMACY.

36, OXFORD STREET, LIVERPOOL.

Principal : J. S. WARD, Ph. Ch., M.P.S.
(*Prize Medallist and South Kensington Prizeman*).

Owing to the continued success of this School it has been found necessary to enlarge the premises and fit up an entirely new laboratory.

For *Systematic Botany* the authorities have kindly given permission for full use of the *Liverpool Botanic Gardens.*

A new Prospectus, with full particulars of the school premises, curriculum, fees and testimonials, will be forwarded on application.

WESTMINSTER COLLEGE

TRINITY SQUARE, LONDON, S.E.

The Course of Lectures and Classes for Minor Students has just commenced.

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COURSE OF 130 LECTURES

ON

Heat, Light, Electricity, Magnetism, Materia Medica, Botany, Organic and Inorganic Chemistry.

The above Course is delivered *three* times during each Session, commencing in September, January, and May.

Morning Lectures at 12. Afternoon Lectures at 3.30.

These Lectures are especially adapted to the requirements of Medical and Pharmaceutical Students.

Printed Syllabus free on application.

The next Course for Major Students May 1st.

FEES—MINOR OR MAJOR.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

June Exam.	...	**£5 5s.**	**July**	...	**£7 7s.**
December	...	**£10 10s.**	**12 Months**		**£15 15s.**

PRELIMINARY EXAMINATION.

The Day Classes for the July Examination have just commenced. Students who wish to pass should enter at once.

Those unable to attend in daytime can join the Evening Class **any** Friday evening.

At the last Preliminary Examination **10** Students presented themselves, and the following **7 passed**, viz.:

Mr. W. S. EDWARDS	Mr. A. MINET
„ A. P. EVANS	„ W. J. RUGG
„ F. C. FORD	„ E. TURPIN

Mr. T. F. WEBSTER.

EVENING LECTURES,

Laboratory Instruction and Classes.

Gentlemen engaged during the day, and unable to leave business, may be prepared for the Pharmaceutical Examinations in the evening.

For Prospectuses and other information, apply to

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Legal, Medical, Pharmaceutical, and Exams.

BUTLER SMITH, B.A., 1st B.Sc. (Lond.), assists PUPILS in reading up, day and evening.

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(*JUNE AND JULY MINORS*).

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PHARMACEUTICAL PRELIMINARY, LONDON MATRICULATION, AND ALL MEDICAL PRELIMINARIES.

RAPID and thorough preparation, privately and in class. Postal Tuition for these Examinations and Bell Scholarship. For particulars, enclose stamp, Mr. A. DAWES, 1st B.A. Lond., Adderstone, Vardens Rd., New Wandsworth, S.W. (close to Clapham Junction Station.)

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SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E

Director : Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing Sept. next.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

ENGAGEMENTS WANTED.

AS JUNIOR, in good business. Good Prescriber and Dispenser. Highest references. 4 years' experience. Age 21. Height 5ft. 9in. T. M. CAWTHORN, Hobson, by Lentz-Green Station, Co. Durham.

WITH a view to learning the trade, by a grocer's assistant, who will be glad to treat with a gentleman. E. M., Mr. Maughan, Grocer, Coundon, Bishop Auckland, Durham.

AS MANAGER, or to Manage a Branch with a view to succession. Ætat. 30. Married. 14 years' experience. Minor, &c. B.Sc., 27, S. Owen St., Hereford.

BY W. R. WELLMAN, M.P.S. (1853 to 1881), and at present aide gerant of a French Pharmacie, as Correspondent, Interpreter, Agent, Traveller, Manager, or TEMPORARY. Thorough knowledge of English and French Pharmacie. BIGNON, 5, Rue Mazagran, Biarritz.

OUT-DOOR ASSISTANT, age 28 years. Can Prescribe and Extract Teeth. Good references. F. A. DE SAULLES, 3, Stockwell Avenue, Stockwell Rd., Brixton, S.W.

AS ASSISTANT. South Coast preferred. 6½ years' experience. Minor. Age 23. Height 5ft. 10in. WM. SHEPARD, Quay St., Newport, Isle of Wight.

AS ASSISTANT, in mixed business, or to Dispense for a Surgeon. Age 23. 8 years' experience. Good reference. CHEMICUS, 44, Gray St., Northampton.

APPRENTICESHIP, 3 years, in-doors, for son of a deceased Chemist, in light genteel business. Age nearly 17. Rather short stature. Passed Preliminary examination. Capable, tractable, steady and trustworthy. Premium must be moderate. Full particulars, T. H., 2, Ennerdale Villas, East Finchley, N.

AS JUNIOR, with time for study. In-doors. Age 24. Salary no object. STATIM, care of Mr. Fisk, The Terrace, Camberwell, S.E.

ENGAGEMENTS WANTED.

TO Dispense 4 hours a day. Good experience. Age 29. A., 4, Carlton Villas, The Grove, South Lambeth.

AS Assistant. Unregistered, active, experienced in Mixed country business. Good references. Aged 34. Height 5ft. 8in. Single. Total abstainer. C. N., 12, Chapel St., Uxbridge, Middlesex.

LOCUM Tenens or Temporary. Now disengaged. Long experience. Good references. G. P. Harold, Battle, Sussex.

AS Assistant, where one or more are kept. 6 years' experience. Good references. Abstainer. Disengaged 22nd inst. State hours, &c. J. N., Mr. Tenison Smith, Union St., Ryde, I.W.

TEMPORARY. Ætat 31. Town or country. By day or week. Thoroughly experienced in all branches. Irreproachable references. Terms moderate. Disengaged. A. Wood, 7, Woodfield Cres., Harrow Rd.

AS Improver.—The friends of a young man, 20, who is thoroughly trustworthy, steady, and obliging, desire for him a situation where out-door exercise could be combined with his other duties. Only a small salary required. X., Mrs. Hamlyn, 17, Longbrook St., Exeter.

IN good class business. Well up in all branches. 5 years' experience. Age 22. Height 5ft. 8in. Would be pleased to treat with a Dentist. H. A. S., 16, Richmond Rd., Handsworth, Birmingham.

AS Assistant or Manager. Major qualification. Age 25. 10 years' experience. Major, 20, Howard St., Bradford.

AS Junior in a good class Dispensing business in Bristol or neighbourhood. 4 years' experience. Age 20. P. H. W., Bright Villa, Somerville Rd., Bishopston, Bristol.

STUDENT, age 22, with London experience, attending lectures during the day, wishes employment for spare time. In or out-door. Chemist, D. Anderson, 1, Vine St., Minories, E.C.

AS Temporary Assistant or Manager. Town and country experience. Minor qualification. Age 27. T. Ascott, 68, Broad St., Worcester.

AS Junior. North of England preferred. In or out-door. Ætat. 20 years. Height 5ft. 5in. 6 years' experience. Good references. W. J. McIntosh, 159, Stratford Rd., Sparkbrook, Birmingham.

A REGISTERED Chemist and Druggist (25), wishes to assist a Chemist, or take charge for a few hours daily. London or suburbs. Or Dispense for a Surgeon. W. Sutton, Scotney, Micheldever.

LOCUM Tenens or Temporary Assistant. Qualified. By the day, week or month. Town or country. Chemicus, 6, Manchester St., Gray's Inn Rd., W.C.

AS Manager. By week, month, or permanent. Disengaged. Married. Age 40. Active and obliging. R. C. Turton, Richard & Co., Chemists, 82, Copenhagen St., Islington, N.

AS Assistant, in London. Minor qualification. 6½ years' experience. Age 24. X. Y. Z., 2, Belvedere Ter., Cambridge.

AS Junior Assistant. Age 22. Height 5ft. 6in. Can Extract Teeth. &c. Chemist, 138, High St., Cefn, Merthyr.

AS Junior, with time for study. In-door or out. London or suburbs. Good references. Ætat. 20. Height 5ft. 8½in. J. H., 55, Pentonville Rd., N.

AS Assistant, in town or country, by a French assistant, wishing to complete his knowledge of English. 6 months' London experience. Would like to exchange lessons with proprietor or family. Soudain, 49, Haymarket, London.

ENGAGEMENTS WANTED.

THE advertiser, age 20, who has 2 years' experience in Dispensing establishments, wishes an engagement as Improver, where he could have ample time for study and out-door exercise. Height 5ft. 7in. Small salary accepted. J. C. W., Montpelier House, B. Salterton, Devon.

AS Assistant to Retail counter, been used to Mixed trade. 3½ years' experience. Willing to make himself useful. Age 28 years. Outdoor. Disengaged. Chemist, 6, Charlwood Ter., Putney.

AS Manager, either temporary or permanent (the latter preferred). In town or country. Experienced in Prescribing and Dentistry. Married. D., 1, Marion Villas, Strode Rd., Forest Gate, Essex.

IMPROVER. Small salary. A. B., 62, Fullerton Rd., East Hill, Wandsworth.

AS Junior, in good Dispensing establishment in London, for a few months only. Salary no object. Age 22. F. W. T., 36, High St., Newport Pagnell.

AS Assistant in London, with part time to attend lectures. First-class experience and references. Age 22. J. J., Messrs. Ayrton & Saunders, Duke St. Liverpool.

AS Junior in London or suburbs. Age 19. Over 3 years' experience. Height 5ft. 8in. A. Gibbs, 6, Royal Parade, Blackheath.

AS Junior. Age 21. Good address. Well up in all branches. Can Extract Teeth. Good references. Junior, 16, Gillespie Rd., Blackstock Rd., Finsbury Pk.

ASSISTANTS WANTED.

APPRENTICE.—W. Bevan, Pharmaceutical Chemist, Brondesbury Ter., Kilburn, N.W., has a vacancy for an educated gentlemanly youth. Every facility for gaining a thorough knowledge of Pharmacy in a good class Dispensing business. Time allowed for study and recreation. Comfortable home.

APPRENTICE for an old-established business, in healthy London suburb. Time for study and recreation, also to attend lectures. Apply to A. B., care of Messrs. Davy, Yates & Routledge, 64, Park St., Southwark, S.E.

AN active Junior Assistant, with Minor qualification, of gentlemanly appearance and address, for first-class Dispensing and Retail business. Address, Mr. Hall, West Cliff Pharmacy, Folkestone.

AN Assistant, about 23 or 24. Well up in Dispensing and general Retail. Particulars to F. Rossiter, 20, George St., Hastings.

AT once.—An Assistant, age 25. Must be a good Counterman and able to Prescribe thoroughly. Personal interview preferred. T. C. H., 342 & 4, High St., Stratford, E.

JUNIOR.—Immediately for 3 months. Comfortable home and time for study. Address, with usual particulars, to R. Taylor, Chemist, Rugby.

COMPETENT Assistant. Age about 24. Apply, with full particulars, to George & Welch, Worcester

IMMEDIATELY.—A competent Assistant for a medium class trade. No Sunday duty. Minor qualification preferred. Out-door. Permanency. Apply, personally, if convenient, or by letter, stating full particulars, with references, to F. Wastie, Kennington Cross, London, S.E.

A GOOD Dispensing Assistant, in-doors, accustomed to first-class business. State age, height and salary, also last situation, to Gibbs & Gurnell, Chemists, Ryde. All letters not answered in three days may be considered as declined.

ASSISTANTS WANTED.

A JUNIOR Assistant, in-door or out-door, in a general country business. Short hours. No Sunday duties. Situation required for a youth, aged 20, as Improver. Passed the Preliminary. Apply, with usual particulars, stating salary, &c., to Pattinson Hayton, Wigton, Cumberland.

MANCHESTER.—Wright & Barnaby, require an in-door unmarried Assistant, about 25 years of age, with Minor qualification, to Manage a select Branch. Must have had recent practical experience in a Dispensing business. State age, height, salary, when at liberty, and enclose carte. Address, Mr. Barnaby, 223, Oxford St., Manchester.

AT once.—For a light Retail seaside trade, a gentlemanly Assistant, accustomed to good class business. Apply, stating usual particulars, and enclose carte (which shall be returned), to P. H. M., Barron, Harveys & Co., Giltspur St., London.

IMMEDIATELY, a competent Assistant for a new business in a first-class suburb. A good Counterman, accurate Dispenser, sober and obliging. May be required to travel occasionally. Hours about 8 to 9. Apply, stating usual particulars and salary required, indoors, to E. D., 28, Norwood Rd., S.E.

AN Assistant, in-door, not under 23, accustomed to a first-class Retail and Dispensing business. Apply, stating age, height, salary required, references, with carte, if convenient, to E. J., care of Messrs. Reynolds & Branson, Chemists, Leeds.

IMPROVER, to assist in Dispensing. Time allowed for study. Apply to E. T. Whitehead, Battersea Provident Dispensary, 175, High St., Battersea, S.W.

DRUG and Chemical trade.—A first-class Warehouseman, also an Assistant at the Counter. Apply by letter, stating age, experience and salary required to Aleph, care of Mr. C. R. Brown, 40, Sun St., Finsbury, E.C.

A COMPETENT Junior Assistant, about 22. In-door. Must be well up in Dispensing, have a good knowledge of a Mixed business, and be thoroughly well recommended. Senior, apprentice, &c., kept. Churchman preferred. Send carte if convenient, which will be returned. State age, salary required, references, &c. Thomas Sellors, Coventry.

MANAGER for a business in Cornwall. No heavy Oil and Colour trade, but good class country business. Apply, stating full particulars to Mrs. Hall, Chemist, Camborne, Cornwall.

MR. T. G. RICHARDS, Hastings, is wanting an out-door Assistant, not under 25. Full particulars of salary expected, hours accustomed to, duration of all previous engagements, &c., would be a great help in replying.

A JUNIOR at once. Must be trustworthy and a careful and accurate Dispenser. Apply, stating full particulars, to E. Humphries, Chemist, Garston, Liverpool.

AS early as possible, a competent Assistant. Must be a good Dispenser. Apply, with all particulars as to age, height, salary, reference, &c., and when disengaged, to Mr. J. A. Spargo, Chemist, 1, Pier Ter., Lowestoft.

FOR May 16th.—An active and energetic Junior or Improver, of gentlemanly appearance and address, who can Dispense (one just out of good apprenticeship not objected to), for a select Dispensing business. Apply, stating age, height, salary, and references, enclosing carte, to Mr. Browne, Chemist, Eastbourne, Sussex.

ASSISTANT in a first-class business where two or more are kept. Age 23. Minor qualification. Chemicus, 9, King's Parade, Cambridge.

ASSISTANTS WANTED.

IN-DOOR Assistant, qualified, about the first week in June, for Retail or Dispensing, where several others are kept. First-class references required. Enclose carte (to be returned). Salary £5 a month. Philadelphus Jeyes, Northampton.

EDWIN HALL, Weston-super-Mare, is in immediate want of a Junior Assistant. Must have been accustomed to good class Retail and Dispensing. State age, height, references, and enclose carte de visite, which will be returned.

A COMPETENT Assistant. In-door. Must be well up in Dispensing, have a good knowledge of a Mixed business. Would have to take part Management. Apply, giving age, height, salary, and experience, with carte if convenient, to C. Birkett, Bowness-on-Windermere.

A JUNIOR Assistant, out-door. Age about 22. Apply, with carte (to be returned), to C. G. Targett, Chemist, Weymouth.

IMMEDIATELY.—An Improver or Junior Assistant. State age, references and salary required, to F. J. Lea, 43, Tontine St., Folkestone.

ASSISTANT for Chemist's Retail. Must also be well up in Mechanical Dentistry; or one wishing to learn Dentistry will be treated with. Enclose photo., references, &c., G. H. Horne, Chemist and Dentist, Douglas, Isle of Man.

AS Junior, by the end of May, for a first-class business, on South Coast. Must have been accustomed to Dispensing. Address, stating age, height, salary required, with reference, enclose carte, to S. B. Maggs, 36, Marina Ter., St. Leonards-on-Sea.

IMMEDIATELY.—An Assistant, about 22. State age, height, salary, and usual particulars, enclosing photo. (to be returned), to J. W. Taplin, 13, Desboro' Pl., Harrow Rd., London, W.

MANAGER for a Branch, at once. One accustomed to good Dispensing and Retail, with thorough knowledge of Prescribing. Single, and Minor or Major qualification. Unexceptional reference. Apply, stating full particulars of experience, &c., with age, height, and photo, to J. H. Read, 2, Market Ter., Upper Holloway.

AN Assistant, about 22 or 24 years of age, with Minor qualification. Apply, stating age, height, salary, &c., to A. S. Dampney, 87, Abingdon Rd., Kensington.

IMMEDIATELY.—A competent Junior to Manage a Branch. An energetic young man who is a good Counterman required. Salary to commence, £30 and commission. In-door. Apply, personally if possible, before 11 or after 6, to Surgeon, 513, Hackney Rd., London.

FOR May 21st.—A competent Assistant (two and apprentice kept) of good appearance and address, accustomed to the best class of trade. Must be a good Counterman and write a neat hand. Apply, enclosing carte and full particulars, to Edw. Pearson, Nottingham.

BATH.—Steele & Marsh will have a vacancy the first week in June for a gentlemanly trustworthy Assistant. One accustomed to good class Dispensing and Retail. Four kept. Apply, stating age, height, salary and references, with carte (to be returned).

FOR a few months.—A neat and accurate Dispenser, accustomed to good class business. Apply, with usual particulars and carte, S. A. Smith, 102, Parade, Leamington.

COMPETENT Assistant for good country trade. Must be energetic, give first-class references. Address, Caistor, care of Barclay, Farringdon St., London.

ASSISTANTS WANTED.

WHOLESALE.—Experienced ASSISTANT wanted for Wet counter, for first-class house in Scotland. Must be well recommended. £80 to £100. Apply, stating age, experience, &c., to L., Messrs. Batler & Crispe, 4, Cheapside, London, E.C.

NORTH of England.—Junior ASSISTANT in good business house. Must have good address and be not afraid of work. Salary £30 per annum, board and lodging. Address, J. ROBERTS, Chemist, Whitley, Newcastle-on-Tyne.

BY a West-end firm, a Junior ASSISTANT of gentlemanly appearance and address. Apply, Hearon, Squire & Francis, 5, Coleman St., E.C.

AS ASSISTANT. About 22. Of good appearance and address. Must be an accurate Dispenser and write a good hand. Apply to J. CHILWELL, 452, Oxford St., W.

A THOROUGHLY competent ASSISTANT, also a TURNOVER or JUNIOR, by BARNES & SON, Pharmacists, Preston.

JUNIOR ASSISTANT. Salary £30. Apply, with full particulars, to W. SADLER, 115, Stoke Newington Rd., N.

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A BUSINESS. Established upwards of 50 years. Best position in a South Yorkshire market town. Ready-money trade. For particulars, apply Mrs. J. G. JOHNSON, 21, Cheapside, Barnsley.

A GENUINE old-established Retail and good Prescribing BUSINESS, in a large market town in Yorks. Immediate possession. Good shop and house, large warehouse. Rent £60. Returns about £1100. Stock, fixtures, and goodwill from £1100 to £1200. Address, J. B., Messrs. Davy, Yates & Routledge, 64, Park St., Southwark, London.

PARTNERSHIP.—The proprietor of an old and profitable country business wishes to arrange with an energetic single man to develope a new undertaking. £200 to £500 may be invested, but an active, suitable man will be considered more than capital. Address, INTRODUCO, Messrs. Barron, Squire & Co., Bush Lane, London.

AN excellent start for an energetic young man about commencing business on his own account. One of the nicest suburbs of London, W., with a long lease and low rent. Address, Mr. BIRCH, 21, Lindore Rd., New Wandsworth, S.W.

GOOD class BUSINESS, in a growing neighbourhood. 5 miles from City. Handsome shop. Good house at moderate rental on lease. Position is undeniably good. Satisfactory reasons for disposal. Price £600. No agents. Address, B. G., Messrs. Meggeson & Co., Miles Lane, Upper Thames St., E.C.

CHEMIST and Herbalist, Prescribing and Retail BUSINESS. Kent. £160, including stock, fixtures and household furniture. Good house. Rent low. Market town. Has done £6 a week. Splendid chance for beginner. Good reasons for leaving. By letter, DELTA, Gabriel & Troke, 82, City Rd., London.

A GOOD seaside BUSINESS. A prominent corner. Fairly fitted and well stocked. Last year's returns £1100. Fair profits. £250 cash will purchase. Trial given. No agents treated with. Reference required with application. R. H., care of Bourne & Taylor, Castle St., Holborn.

GENUINE Prescribing and Retail BUSINESS. Now returning £8 weekly. Price £200. Unopposed. Dentistry much needed. Will bear the strictest investigation. Satisfactory reasons for disposal. Apply on the premises, 3, Market Pl., Stratford Rd., Upper Plaistow.

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MESSRS. GURDEN BERDOE have for transfer:—SOUTH COAST. Fashionable sea-side town. Dispensing and Retail. Full prices. Showing £360 net profit. Rent £35. Price £650. SUFFOLK. Death vacancy. Retail, Dispensing and Prescribing Trade. Same hands 13 years. Returns £1100. Large house. Rent £40. £750, and part remain. YORKSHIRE. Retail and Dispensing Trade. Nothing heavy. Excellent house. Important town. Returns £1550. Price about £1100. MIDLANDS. Unopposed good Family and Agricultural Trade. Returns £700. Good house and gardens. For £300. ESSEX. Strictly reliable. Unopposed Retail, Family and Prescribing Trade. Nothing heavy. Returns £700. Rent £22. Good house and garden. For £350. LONDON, W. Old-established corner Retail and Dispensing Trade. Returns £700. Can be increased. Another. Suit beginner. Strictly reliable. Returns £7 weekly. For £275. Well fitted and stocked. Also one same hands 4 years. Taking larger trade. Returns £4 weekly. For £65. S.E. Retail and Prescribing Trade. Showing £500 net profit. For £850. Old-established City Business. Returns £2200. For £1000 cash, and balance by arrangement. Apply, 30, Jewry St., Aldgate, City.

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WEST-END.—A good class Retail and Dispensing TRADE. Close to the squares. Handsome corner lock-up shop, well fitted and stocked. Now worked by a manager exclusively, but returning £10 to £12 weekly. Principal there daily would soon do £1000. Rent £52, no taxes. Long lease. Owner having another business, cannot attend to this. Only £350. Principals apply BETA, 59, Petherton Rd., Highbury, N.

FASHIONABLE seaside town.—Immediately. A good class BUSINESS, returning £1100 per annum. Corner shop in leading position. Good proprietary attached. Rent £40. Long lease. Introduction given. Only £450 required (half can remain). Messrs. HINE GILBERT & Co., 17, Hart St., Bloomsbury, London, W.C.

N.W. DISTRICT.—An old established Retail and Prescribing BUSINESS, in a thickly populated neighbourhood. Capable of considerable increase. For little more than price of stock and fixtures. Rent £40, nearly cleared. Long lease. Near railway station. 'Buses and trams pass door. Price £160. Apply to T. C., 17, Kentish Town Rd., N.W.

BUSINESS, in best part of fashionable watering place, to be sold a bargain, through ill health of proprietor. Rare opportunity for a young man to start for himself, as part of the money might remain on good security. For personal interview, principals only address CHEMIST, Deacon's, Leadenhall St., London.

WANTED TO PURCHASE.

A GOOD class Retail and Dispensing BUSINESS, returning from £800 to £1000. Or a PARTNERSHIP, with view to succession. Within easy distance of London. Advertiser has had first-class experience. Proprietors only. Address, AMICUS, care of Mr. Marsh, 92, Tollington Park, N.

A GOOD Dispensing and light Retail BUSINESS (full prices), requiring the investment of from £1200 to £1800. Convenient house and good locality. Particulars to CHEMIST, 88, Westow Hill, Upper Norwood, London, S.E.

AN improving BUSINESS, on or near South or South West coast, or within easy rail of London. Cash to £1000 at command. W., care of Mr. Hodkinson, Chemist, Macclesfield.

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TERMS FOR ADVERTISEMENTS

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Those for Businesses for Disposal, &c., will be found on page xxi.

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Uses. Physicians have prescribed it for the last twenty years more extensively than any other preparation of the kind. They have found it useful in a great variety of maladies, and especially suitable as an addition to the diet of delicate children, and in all cases of pallor and general weakness in adults as well as children.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 724.] SATURDAY, MAY 10, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-third Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 21st day of May, 1884, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

NOTICE of motion to be proposed at the Annual General Meeting of the Pharmaceutical Society of Great Britain, on Wednesday, May 21st, 1884, by

RICHARD W. GILES.

"That the Council of the Pharmaceutical Society be requested to consider the best means of promoting *systematic Pharmaceutical Research*, either by the institution of a Laboratory and Staff devoted to that purpose, or by such other means as may, after full investigation, appear best calculated to effect the object in view, which shall primarily be the initiation, examination and improvement of contemplated or existing formulæ of the National Pharmacopœia."

CONVERSAZIONE.

By permission of the Lords of the Committee of Council on Education, the Annual Conversazione of the Pharmaceutical Society will be held at the South Kensington Museum, on the evening of Wednesday, May 21st, at eight o'clock.

Each Associate and Apprentice of the Society, and each Chemist and Druggist on the Register, may, on application to the Secretary, obtain a card of admission for himself.

A card of admission has been sent to each Member and Associate in Business of the Society, to admit *himself and a lady*.

N.B.—No person can be admitted *without a ticket*.

THE JACOB BELL MEMORIAL SCHOLARSHIPS.*

TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the Lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships take place on the second Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

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* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

Special Notice to Advertisers.—See p. iii.

Price 1s., or post free 1s. 5½d.

The Calendar of the Pharmaceutical Society

FOR 1884.

Copies will be supplied by the REGISTRAR, 17, Bloomsbury Square, London, W.C.

THE THIRTEENTH ANNUAL DINNER

OF THE

Members of the Pharmaceutical Society

AND THEIR FRIENDS

WILL TAKE PLACE AT THE HOLBORN RESTAURANT,

On TUESDAY, MAY 20th, 1884, at Half-past Six o'clock.

THE PRESIDENT IN THE CHAIR.

COMMITTEE.

THE PRESIDENT.
THE VICE-PRESIDENT.
THE TREASURER.
PROFESSOR ATTFIELD.
FREDERICK BARRON.
ISAIAH BOURDAS.
E. NORTHWAY BUTT.
THOMAS GREENISH.
WALTER HILLS.
DR. PAUL.

Honorary Secretary, RICHARD BREMRIDGE.

Tickets, One Guinea each (including Wine) can only be obtained from the Honorary Secretary, RICHARD BREMRIDGE, 17, Bloomsbury Square.

To the Members of the Pharmaceutical Society.

My nomination as a Candidate for Election to the Council of the Pharmaceutical Society appears to me to suggest that some indication of my views on points which more especially affect the interests of Chemists should be placed before the Members, by way of justifying my present candidature.

In the first place, I would express the opinion that the Council as now constituted cannot be regarded as thoroughly representative of the trade in general. The reason is not difficult to find, its Members consisting chiefly either of gentlemen connected with West-end pharmacies, or with the larger and more extensive of those in the provinces, and of wholesale druggists whose interests are, to say the least, more closely identified with practitioners of medicine than those of pharmacy. The pharmacists of smaller establishments, *i.e.*, such as form the bulk of Members of the Society, are thus left practically unrepresented.

That the Society does not possess the popularity to which it is fully entitled is unmistakably evidenced in the continual decrease in its "Pharmaceutical" Membership. My own impression is, that this diminishing confidence is the natural corollary of a widespread and by no means groundless feeling that the Society does not address itself sufficiently to furthering the more general commercial interests and welfare of Chemists. Without in any way neglecting the purely scientific and educational work, of which it has reason to be proud, the Society might greatly increase its popularity by increased action in the direction named.

The Pharmacy Amendment Bill, as a whole, I see no reason to disagree with, though certain clauses are open to serious objection, *e.g.*, that which relates to the "sale of poisons," or even more particularly that which proposes to deprive the Major qualification of its distinctive character, and consequently of its value.

Membership of the Society should not be voluntary, that is, the "Minor" and "Major" fees should be so adjusted that passing the respective examinations should include life "Membership" or "Fellowship." The advantage of such an arrangement is obvious.

The examinations of the Society seem to me most efficiently conducted, and call for no alteration of any moment.

The Government having undertaken to introduce a Bill dealing with the poisons question, little need be said on the subject. Nothing short of restricting their sale, in "proprietary," "patent," or any other form, to persons properly qualified to deal in them, can be satisfactory or equitable.

Yours faithfully,

J. RYMER YOUNG.

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Chemists & Druggists' Trade Association of Great Britain.

NOTICE OF ANNUAL GENERAL MEETING.

NOTICE IS HEREBY GIVEN, that the EIGHTH ANNUAL GENERAL MEETING of the Members of this Association will be held in the Banqueting Room of the INNS OF COURT HOTEL, LINCOLN'S INN FIELDS, LONDON, W.C., on Tuesday, May 20th, 1884, at Twelve, noon, for half-past Twelve, for the transaction of the following buisness:—

To receive and consider the Report of the Executive Committee, and the General Statement of the Funds of the Association.

Mr. Jervis will move that Rule VI. be amended to read as follows:—The Executive Committee shall consist of twenty-four Members to be elected by ballot at each Annual Meeting. Five Members to form a quorum. It shall be the duty of the General Committee to prepare and recommend to the Annual Meeting a list of the names of Members to serve on the Executive Committee for the ensuing year. A President, a Vice-President, a Treasurer, and an Honorary Secretary shall be elected by and from the Executive Committee.

To elect an Executive Committee and Officers for the ensuing year.

To discuss questions affecting the interests of the Trade.

W. F. HAYDON, *Secretary.*

OFFICE OF THE ASSOCIATION,
23, BURLINGTON CHAMBERS, NEW STREET,
BIRMINGHAM, *May 9th*, 1884.

NOTICE TO ADVERTISERS.

THE PHARMACEUTICAL JOURNAL of MAY 24 will contain—

The Report of the Annual Meeting of the Society.
The Result of the Election to the Council.
Notices of the Annual Dinner, Conversazione, &c.
The Report of the Annual Meeting of the Chemists' and Druggists' Trade Association.

Advertisements for this important Number should be forwarded without delay. No extra charge, the terms being the same as for ordinary issues, viz., Whole Page, £4 4*s.*; Half Page or Whole Column, £2 2*s.*; Quarter Page or Half Column, £1 1*s.*; Eighth Page or Quarter Column, 10*s.* 6*d.*

Further particulars may be had on application to the Publishers,
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Retail price, 2/- per tin.

Our Dog Medicines and Foods, Dog Soap, &c., can be obtained of all Wholesale Houses, or of

"SPRATTS PATENT," BERMONDSEY, S.E.

HUBBUCK'S PURE OXIDE OF ZINC.

See PHARMACEUTICAL JOURNAL *of May* 1, 1856.

Sold by the following Wholesale Druggists, in Stamped Boxes of 7 lbs. and 14 lbs.:—

Baiss Brothers & Co.
Barron, Harveys & Simpson.
Barron, Squire & Co.
Battley & Watts.
Burgoyne, Burbidges & Co.
Clark & Pinkerton.
Clarke, Bleasdale & Co.
Clay, Dodd & Case.
Corbyn, Stacey & Co.
Davy, Yates & Routledge.
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Evans, Lescher & Webb.
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Ferris, Boorne & Co.
Gale & Co.
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Hodgkinsons, Stead & Treacher.
Horner & Sons.
Huskisson, H. O., & Co.
Johnson & Sons.
Langton, Harker & Stagg.
Lofthouse & Saltmer.
Mather, William.
Southall, Brothers & Barclay.
Sumner, R., & Co.
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Woolley, James, Sons & Co.
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THOMAS HUBBUCK & SON, 24, Lime Street, LONDON.

DRUGS, CHEMICALS, & PHARMACEUTICAL PREPARATIONS

BARRON, SQUIRE & Co.

(LATE DREW, BARRON & CO.)

WHOLESALE & EXPORT DRUGGISTS,

BUSH LANE, LONDON, E.C.

Manufacturers of all descriptions of Pharmaceutical Preparations,

Beg to inform Merchants, Shippers, &c., that all Indents entrusted to them will receive careful attention and prompt execution.

Messrs. B., S. & Co. request the attention of their friends and the Trade, at home and abroad, to their having PURCHASED THE BUSINESS of Messrs. JAMES BASS & SONS, Hatton Garden, and with it the various formulæ from which their Special Preparations have been made, and pledge themselves to supply them in all their integrity.

Specimens of these Preparations have remained in the Museum of Kew Gardens during 23 years without deterioration.

GELATINE COATED OVAL PILLS

We are now preparing the above, which are **the only Oval Gelatine Coated** or **Capsuled Pills of English Manufacture** at present in the market. We are also issuing a **Special List**, devoted exclusively to the above, and which will be supplied on application.

All our pills are sent out in capsuled bottles containing one gross; but, for the convenience alike of Physicians and Pharmacists, we have originated the method of putting up small bottles (each containing 24 pills) to meet the requirements of a single prescription.

WYLEYS & CO. { Wholesale and Export Druggists and Manufacturing Pharmaceutists, } **COVENTRY**

And WYLEYS, WALKER & CO. 223, UPPER THAMES STREET, LONDON.

SAVORY & MOORE'S

PANCREATIC EMULSION

OR PEPTONISED (PREDIGESTED) FAT,

LARGELY PRESCRIBED AS AN ARTICLE OF DIET IN ALL CASES OF

Consumption, Wasting, Loss of Appetite, Strength and Digestive Power.

The special advantage of Pancreatic Emulsion is that it provides the NATURAL STABLE SOLID FATS OF FOOD, predigested by the action of the pancreatic secretion, so that they can be taken without the least disturbance of the digestive functions. As it provides SOLID fat, it is well to make it alternate with a liquid fat, like cod-liver oil, even where the latter agrees, and in many cases where cod-liver oil disagrees, it may be permanently substituted with the greatest advantage, or it may be taken with the oil, the assimilation of which it actively promotes.

The Emulsion is of the consistence of Devonshire cream, easily miscible with fluids, and quite unobjectionable in taste. It may be given in milk or water, and with the addition of a little wine or brandy if desired.

In Bottles, 2s. 6d., 4s. 6d., and 8s.

SAVORY & MOORE, 143, NEW BOND STREET, W.

JAMES EPPS & CO.'S
HOMŒOPATHIC MEDICINES

ARE SUPPLIED IN BOTTLES

FULLY LABELLED

WITH PRINCIPAL USES, DOSE, AND REPETITION.

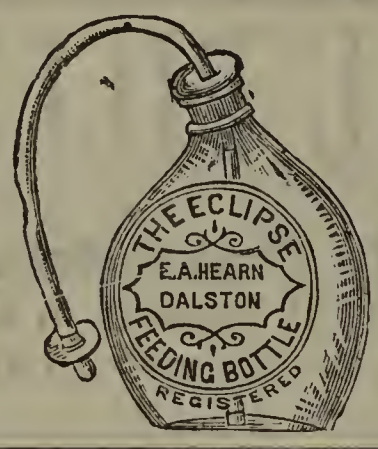
For Price List send Trade Card to

48, THREADNEEDLE STREET.

Feeding Bottles.

The "ECLIPSE."

White Fittings, 30/- per gross.
Best Black Fittings, 36/- "



These are put up in One Dozen Wood partitioned Boxes.

HEARN, RIDDELL & Co.
GLASS BOTTLE
MANUFACTURERS,
381, KINGSLAND RD., LONDON, E.

GLASS BOTTLES of EVERY DESCRIPTION, either PLAIN or STOPPERED, made in WHITE, BLUE, AMBER, ACTINIC GREEN, or any other colour required.

SPECIAL ATTENTION GIVEN TO QUALITY.
Quotations, post free, to any part of the world on application.

The above will be found the BEST and CHEAPEST House in the trade.

"OUR LITTLE PETS" FEEDING BOTTLE

Fitted with Best Glazed Earthenware Caps.

Each Bottle, with two Brushes, put in Handsome Cardboard Box, bearing our Copyright Label.

White Fittings, 84/- per gross.
Black " 90/- "

CHUBB'S BEST SEIDLITZ POWDERS

Full Weight—Howard's Materials, Loose, at **7s.** per gross, and in lift off boxes, **7s. 6d.** per dozen; hinged boxes, **8s. 6d.** per dozen.

CHUBB'S EXTRA SCENTED VIOLET POWDER

(WARRANTED PURE STARCH POWDER),

In 1*d.* Boxes, **6s. 6d.** gross, and 2*d.* Boxes, **12s. 6d.** gross, and in ¼-lb. and ½-lb. Packets, **10d.** per lb.

CHUBB'S PREPARED FULLER'S EARTH

In 1*d.* Boxes, **5s.** gross, and 2*d.* Boxes, **9s. 6d.** gross, and in ROUND Boxes, 3*d.* size, **1s. 9d.** per dozen, 6*d.* size, **3s.** per dozen
SUBJECT TO 15 % DISCOUNT FOR CASH.

May be obtained through all the Wholesale Houses, or direct from

CHUBB & CO. 29, OLD STREET, LONDON, E.C.

SPECIAL QUOTATIONS FOR LARGE QUANTITIES.

TRADE MARK
REGISTERED.

LEECHES! LEECHES!

Warranted Healthy, Wholesale and for Exportation.

Choice quality, Hambro' speckled and Officinal Green. A constant supply always on hand. Delivered free to all parts of London daily.
Special Terms to Wholesale Druggists, Leech Merchants, and Exporters.

FITCH and NOTTINGHAM, Leech Breeders,
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LINT

As supplied to the largest Hospitals in the United Kingdom.

ROBINSON AND SONS,
SPINNERS AND MANUFACTURERS OF
SURGEONS' LINTS & COTTON WOOLS,
WHEAT BRIDGE MILLS, near CHESTERFIELD.

TRADE MARK.

Depot—55, Fann Street, Aldersgate Street, London.

Hunyadi János

CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED) LONDON."

Æsculap

A POSITIVE CURE
FOR
STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

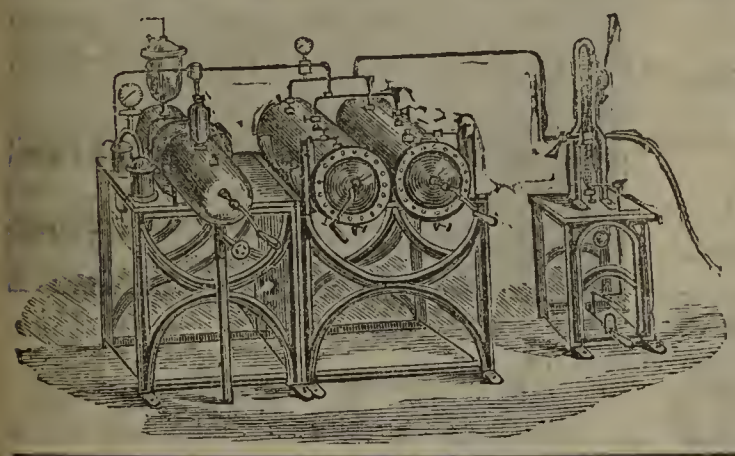
Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

ÆSCULAP BITTER WATER COMPANY, Limited 38, Snow Hill, LONDON, E.C.

SODA WATER MACHINERY,



Patent Stoppered Bottles,

AND ALL APPLIANCES.

Before purchasing send for Catalogues to

DAVENPORT & CO.
99P, High Holborn, London.

IMPORTANT NOTICE.

ZOEDONE

The ZOEDONE COMPANY have much pleasure in informing the trade that they have been able to effect important improvements in the manufacture and flavour of Zoedone.

In order to popularize it and place it within the reach of everyone, it is now (in addition to being put up in champagne bottles as heretofore) also put up in ordinary mineral water bottles and supplied to the trade on such favourable terms as will enable them to retail it at the same price as lemonade.

Bottling agents (who supply on wholesale terms) have been appointed in most of the principal towns in the United Kingdom. A list of these agents will be forwarded on application.

Applications for such agencies are invited for those districts which are not yet represented

80, COLEMAN STREET, LONDON, E.C., 16*th April*, 1884.

NATURAL BITTER WATER OF FRIEDRICHSHALL

INGRAM & ROYLE,

52, FARRINGDON STREET, LONDON, E.C. & BATH BRIDGE, BRISTOL.

Price List and Pamphlet on "Natural Mineral Waters: their Properties and Uses," forwarded on application.

BURROUGH'S SPIRITUS RECTIFICATUS, P.B.

SPIRITS OF WINE CHEMICALLY PURE

The Best English Grain Spirit, free from Fusel Oil.

56 over proof, 19/7 net, prompt Cash, for 5 gallon quantities; also Finest Orange Wine and Sherry for medicinal purposes.

CALE STREET DISTILLERY, LONDON, S.W.

Duty free for Exportation—also best Methylated Spirit at lowest prices.

Registered.

SCHWEITZER'S COCOATINA.

ANTI-DYSPEPTIC COCOA OR CHOCOLATE POWDER.

GUARANTEED PURE SOLUBLE COCOA, of the finest quality, without Sugar or admixture.

The high degree of Solubility and perfect Purity attained *is solely* due to the careful manipulation and delicate MECHANICAL treatment of the finest quality of Cocoa Beans, the *excess* of fat being extracted.

Four times the strength of Cocoas thickened, yet weakened with Arrowroot, Starch, &c., and in reality cheaper.

ADOPTED AS A "MEDICAL COMFORT" IN THE ROYAL NAVY.

In air-tight tins, at 1s. 6d., 3s., 5s. 6d., &c., by Chemists, Grocers, &c.

Sole Proprietors, H. SCHWEITZER & CO., 10, Adam-street, Adelphi, London, W.C.

ASTHMA

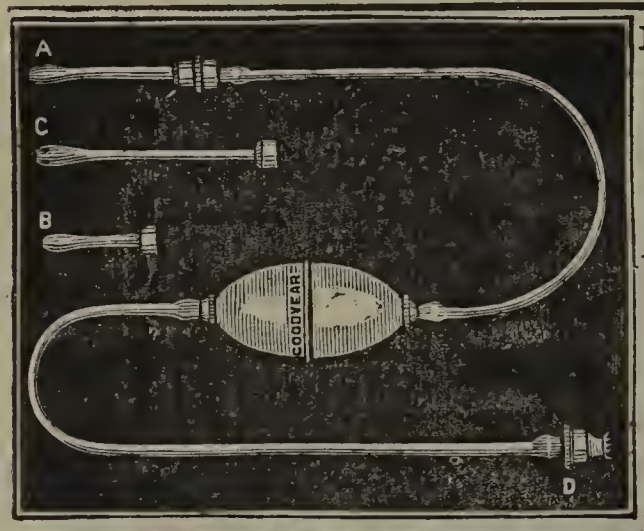
and other MALADIES of the RESPIRATORY ORGANS.

SLADE'S

Anti-Asthmatic Cigarettes,

after many careful trials, and found to be safe, efficient, and agreeable, are now prescribed at the Brompton and Victoria Park Hospitals, and by many eminent Physicians. Delivered in sealed bottles at 2/9, 4/6, and 11/- Sample free on application. A liberal Discount to Pharmacians.

THOS. SLADE, Pharmacian, 118, Long Acre, London, and all the Wholesale Houses.



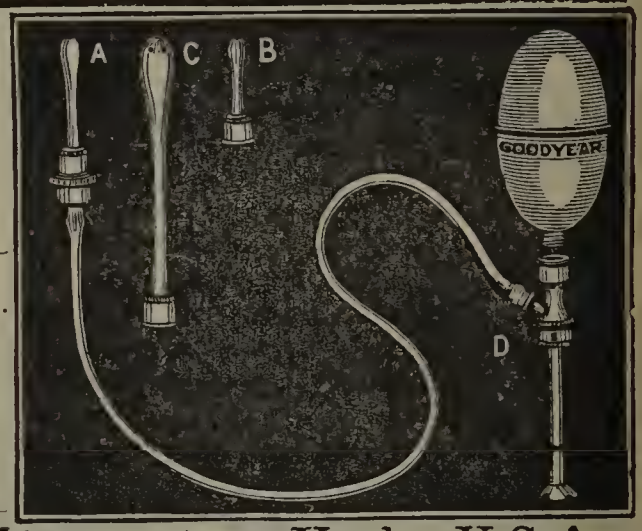
No. 5.

Its superior quality makes it the most desirable of all medium-priced Syringes.

IMPROVED No. 7.

A first-class medium, with Bulb detachable.

Polished Wood Cases.



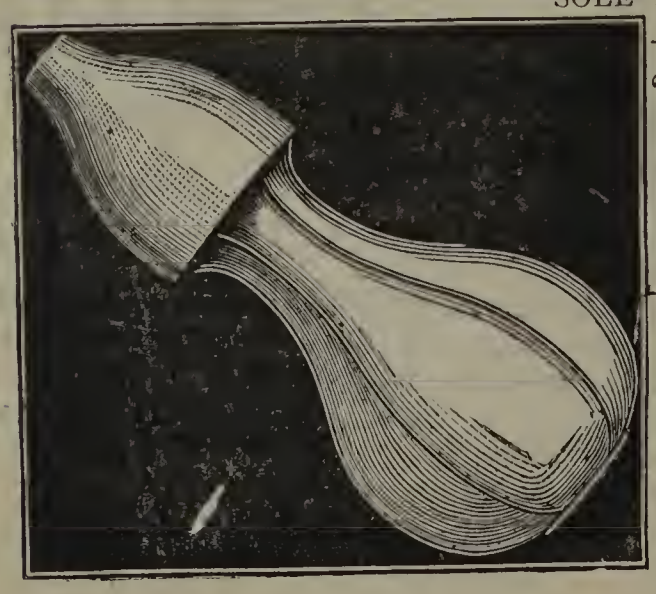
Goodyear Rubber Co. New York, U.S.A.

MANUFACTURERS OF SOFT RUBBER AND VULCANITE

SYRINGES AND ENEMAS.

LAWRENCE BROS. 48, Farringdon Street, E.C.

SOLE AGENTS FOR GREAT BRITAIN.

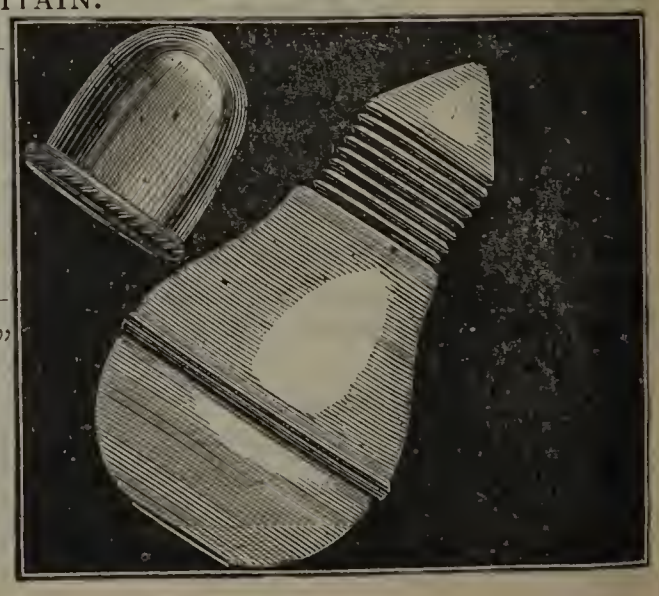


"LADIES'."

Is the simplest and most perfect Vaginal Syringe in the market.

"P.P.P."

A Soft Rubber Urethral Syringe; very useful, as the Solution can be carried safely in the pocket.



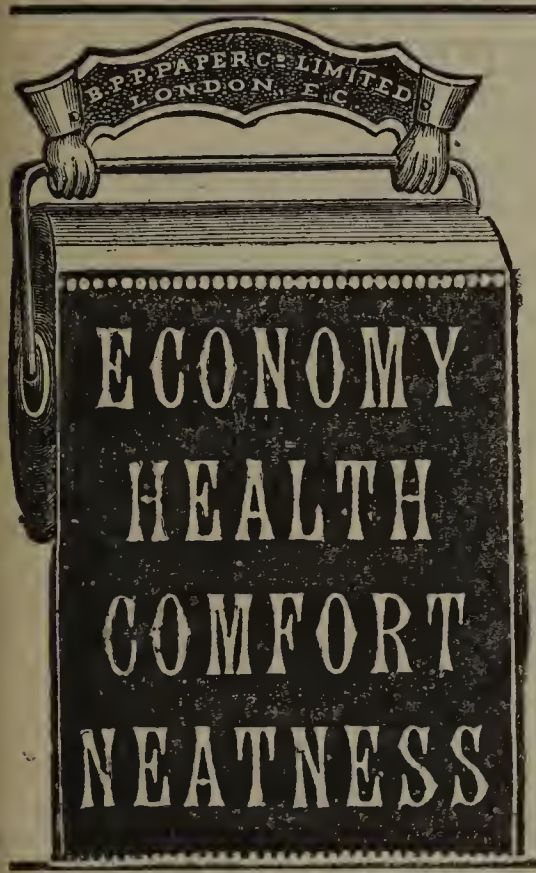
ROBARE'S AUREOLINE,

OR GOLDEN HAIR WASH.

The attention of the Trade is respectfully called to the above Article, now having a large sale, and giving an excellent profit to the retailer.

5/6 size - - - - - - - - 36/- per Dozen.
10/6 „ - - - - - - - - 72/- „

Sole Wholesale Agents, R. HOVENDEN & SONS, LONDON.



THE NEW PATENT PERFORATED

Toilet or Curling Paper and Fixture

SHOULD BE IN EVERY HOUSEHOLD.

THIS Paper is strongly recommended for Family and Hotel use, combining, as it does, great economy and neatness, with protection to health. No stoppage of Drain Pipes. Once tried always continued. Gives great satisfaction.

Roll of Paper containing 1000 Sheets, and Nickel Revolving Holder, complete 2/6
Roll of Paper containing 1000 Sheets, and Bronze Revolving Holder, complete 2/-
Rolls of Paper to refill holders, each 1/-

THE TRADE SUPPLIED.

The British Patent Perforated Paper Company, Ld.

12, Long Lane, West Smithfield, London, E.C.

BURGESS, WILLOWS, & FRANCIS,

WHOLESALE DRUGGISTS
AND
Manufacturing Pharmaceutical Chemists,
101, HIGH HOLBORN, LONDON.

PRICE LISTS ON APPLICATION.

FRY'S MALTED COCOA AND FRY'S MALTED CHOCOLATE

Are combinations of FRY'S PURE COCOA EXTRACT and CHOCOLATE PASTE with ALLEN & HANBURYS' CONCENTRATED EXTRACT of MALT, affording delicious beverages. The Extract may be most agreeably taken in either of these forms. Sold in tins at 1s. and 2s. each, 9s. and 18s. per dozen. The COCOA is in the form of Powder, the CHOCOLATE of PASTE, and sweetened.

Lancet, December 18th, 1880:—"This is an excellent preparation of Cocoa and Malt Extract. It is dried at a gentle heat, to avoid injury to the diastase; its dietetic and digestive value is beyond all dispute, and it is very agreeable in flavour."

See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

To be had of the Manufacturers, all Wholesale Houses, or from

ALLEN & HANBURYS, Plough Court, Lombard Street, London.

KILNER BROTHERS,

Glass Bottle Manufacturers,

10, Gt. Northern Goods Station

KING'S CROSS, LONDON,

Invite the attention of Chemists and others to the large variety of Glass Bottles, &c., that they supply, and solicit orders for same.

DISPENSING.—Green and White Flint, of all sizes and shapes.

PERFUMERY.—White Flint, in different styles.

FEEDING BOTTLES.—"Our Babies' Bottle," in Green and White Glass, with white, brown or black fittings.

Illustrated Catalogues and detailed Price Lists of above and many other kinds forwarded on application.

FOR CHEMISTS.

THE CELEBRATED LONDON TEAS

TRADE MARK REGISTERED.

"*I CERTIFY, after examination of the Books of the GREAT TOWER ST. TEA COMPANY, LIMITED, that during the Year* 1883 *the SALES of their undernoted STANDARD Teas exceeded those of the Year* 1882, *in each case by the percentage thereon named below.*

The CHOICE CHINESE SMALL TEA For Retail at 1/4.	72	per cent.
The LONDON WHOLE-LEAF TEA For Retail at 1/8.	18	,,
The LONDON BROKEN TEA For Retail at 1/8.	22½	,,
The LONDON 2/- TEA For Retail at 2/-.	18½	,,
The LONDON 2/4 TEA For Retail at 2/4.	42½	,,
The LONDON 2/6 TEA For Retail at 2/6.	55	,,
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The LONDON 3/- TEA For Retail at 3/-.	62	,,
The LONDON 3/8 TEA For Retail at 3/8.	90	,,

ERNEST HOLAH, *Chartered Accountant*,
30, BUDGE ROW, CANNON STREET, E.C.
Dated, LONDON, *January 17th*, 1884."

These well-known Teas, when ordered packed, are hand wrapped from the bulk, and forwarded on the day the order is received.

The extraordinary growth in the demand for them is due to the absolute regularity with which each excellent—probably unequalled—standard is maintained.

For samples, prices, and all particulars, apply to
A. HORATIO JONES, *Managing Director*.
THE GT. TOWER STREET TEA CO., Limited, 39, Gt. Tower St., E.C.

KAY BROTHERS,

Operative Chemists and Wholesale Druggists,

(Successors to SIMS, SHAW & HORNBY. Founded 1786).

STOCKPORT,

MANUFACTURERS OF

Acid Sulphurous.
Bird Lime.
Dec. Senegæ Co. Conc.
,, Sarzæ Co. Conc.
Emp. Plumbi.
,, Roborans.
,, Resinæ.
Emp. Picis.
Ess. Zingib (Soluble).
,, Rosæ. Co.
Oxymel Scillæ.
Syr. Ferri Phosph. Co.
,, Rhœados.
,, Violæ, &c., &c.

"COAGULINE" TRADE MARK.

Kay's New Transparent Cement for Broken Articles.

KAY'S COMPOUND ESSENCE

Of LINSEED, ANISEED, SENEGA, SQUILL, TOLU, &c. (with Chlorodyne).

"The Stockport Remedy" for Coughs and Colds.

LINSEED LOZENGES (Solidified Linseed Tea).

CHLORO-LINSEED COUGH LOZENGES.—A medicated Linseed Extract. [Hoarseness, &c.

KAY'S THROAT LOZENGES, for Relaxed or Sore Throat,

KAY'S INSTANT CURE for Toothache.

PAINLESS SOLVENT for Corns and Warts.

LINUM CATHARTICUM PILLS (of the Purging Linseed).

KAY'S TIC PILLS.—A specific and pure Nerve-Tonic.

STRAMONIUM CIGARETTES.—For Asthma.

CUE CEMENT.—For tipping Billiard Cues.

IMPROVED CUE TIP FIXER.

MARKING INK for Linen.

ARNICA HEALING POWDER.—Toilet.

KAY'S TUBES for Feeding Bottles, with patent glass valve. Fit all bottles, and prevent children sucking air.

KAY'S RESPIRATORS.—GOLD PLATED, 2/6 and 5/6.

SAPO-LINI, a Saponified Linseed Jelly; an excellent Toilet Soap.

All articles containing Scheduled Poisons are so labelled.

THE BEST ELASTIC STOCKINGS, LEGGINGS, SOCKS, KNEE CAPS, &c. } 25 °/₀ discount to Chemists.

Prices, Circulars, Show Cards, Specimens, &c., on application.

HAWLEY'S COUNTER ADJUNCTS.

A selection of useful and ornamental preparations, with artistic labels. A medal was awarded to them at the Calcutta Exhibition. Full list, with prices and details, post free on application.

EVANS, LESCHER & WEBB,
60, Bartholomew Close,
LONDON.

EVANS, SONS & CO.
56, Hanover Street,
LIVERPOOL.

PARIS and MONTREAL.

1884 SEASON.

NEW COD-LIVER OIL

ALLEN & HANBURYS are glad to state that the quality of the New Season's Cod-Liver Oil is much better than that of the last two years, the yield also is much larger than that of last year, and prices are in consequence considerably lower. The new oil is pale in colour, and very good in flavour, and ALLEN & HANBURYS can guarantee its remaining bright at 32° F.

SAMPLES FORWARDED ON APPLICATION.

Price 10*s.* 6*d. per gallon in Winchesters.*
3*d. less per gallon for* 1 *dozen, and* 6*d. less per gallon for* 1 *cask or more.*

ALLEN & HANBURYS, PLOUGH COURT, LOMBARD ST., LONDON.

BULLOCK'S PEPSINA PORCI

(Dr. Beale's process). Dose—2 to 4 grains. In small Bottles and in Bulk.

BULLOCK'S ACID GLYCERINE OF PEPSINE

Dose—℥j to ℥ij.

May be prescribed with most substances compatible with Acids. In 4 oz., 8 oz., and 16 oz. Bottles and in Bulk.

Messrs. BULLOCK & CO. beg to direct attention to a paper on "Medicinal Pepsine and Artificial Digestion" in the *Practitioner* for March, 1880, by G. F. DOWDESWELL, Esq., B.A. (Cantab.), F.C.S., F.L.S., &c. Upwards of 200 experiments made by the Author proved the great superiority of BULLOCK'S PEPSINA PORCI AND ACID GLYCERINE OF PEPSINE over all other preparations of Pepsine or form of Pepsine—English, French, German, or American—and confirmed the equally favourable reports of Dr. PAVY (1863) Professor TUSON (1870), and the late Professor GARROD (1878), as to the pre-eminent digestive value of BULLOCK'S PEPSINA PORCI.

Pepsine Wine. Bottles at 3/-, 5/6 & 10/6 | **Pepsine Pills.** Contg. 2, 3 or 4 grs. | **Pepsine Lozenges.** Boxes, 3/- & 5/6. | **Pepsine & Charcoal Lozenges.** Boxes, 2/6 & 4/6.

J. L. BULLOCK & CO., 3, Hanover Street, Hanover Square, LONDON
And of all Wholesale Houses.

MEDICATED GRAPES.

The latest Pharmaceutical novelty. The most tempting of non-secret remedies. Eight (8) formulæ are ready for issue, magnificently boxed, and numbered alphabetically. The medicated fruit has all the appearance of a crystallized jujube, and as a *vehicle* for medicine has not been touched. All formulæ printed on labels and wrappers.

FORMULA **A** is medicated for *cough*, &c. **B** is *aperient*. **C** for *worms*. **D** for *tapeworm*. **E** for *throat affections*. **F** a *strong gastric astringent*. **G** for *rheumatic affections*. **H** an *efficient blood purifier*.

Wholesale 7s. 6d. per doz. boxes net. from Houses named.

Dr. Lennox Browne, of London, writes: "An ingenious idea, and without doubt a valuable medium."

Samples 6*d. post free (any formula).*

DRAPER'S INK (DICHROIC).

THE NEW BLACK INK, different from anything else ever produced.

Writing becomes a pleasure when this Ink is used. It has been adopted by the principal Banks, Public Offices, and Railway Companies throughout Ireland.

It writes almost instantly Full Black.
Does not corrode Steel Pens.
Is cleanly to use and not liable to Blot.
Flows easily from the Pen.
Blotting-paper may be applied at the moment of writing.

May be had in *London* from BARCLAYS, NEWBERYS, EDWARDS, SANGER, SUTTON. *Liverpool:* EVANS, SONS & Co., AYRTON & SAUNDERS. *Leeds:* GOODALL, BACKHOUSE & Co. *Exeter:* EVANS, GADD & Co. *York* and *Edinboro':* RAIMES & Co. *Newcastle-on-Tyne:* ISMAY & Co. *Coventry:* WYLEYS & Co.

SOLE PROPRIETORS:
BEWLEY & DRAPER, Limited, DUBLIN.

FOR TERMS FOR ADVERTISEMENTS, SEE PAGE xviii.

FOREIGN MINERAL WATERS

NETT CASH PRICE ON DELIVERY.

Delivered Free to London Stations or Wharfs, Packing included.

Terms for Quarterly A/Cs.

5 °/₀ Discount, except for Apollinaris and Hunyadi, for which are Special Terms.

Name.	Cases.		Per Doz.		Per Case.		Cases.		Per Doz.		Per Case.	
	Qts.	*Pts.*	*Qts.*	*Pts.*	*Qts.*	*Pts.*	*Qts.*	*Pts.*	*Qts.*	*Pts.*	*Qts.*	*Pts.*
Æsculap	25	50	14/-	11/6	26/9	44/6	25	50	16/6	13/6	30/-	50/-
Apollinaris, Glass (special	50	100					50	100	6/-	5/-	22/-	35/-
do. Stone (terms	50	50					50	50	6/-	5/-	22/-	17/6
Bethesda	50		11/-		38/-		50		12/-			
Birmenstorf	50		11/-		41/-		50		12/-		44/-	
Bonnes	50	50 qrs.	10/6	8/6	42/-	32/-	50	50 qrs.	12/-	7/6 ¼ s.	48/-	29/-¼ s
Bourboule, La	50		9/6		37/-		50		11/-		42/-	
Bussang	50		6/6		24/-		50		7/-		28/-	
Carlsbad	50		8/6		33/-		50		9/6		38/6	
Chales	50 qrs.		7/6 qrs.		28/qrs.		50 qrs.		10/-	½ pts. 8/	40/-	30/-½
Contrexeville	50		8/6		33/-		50		10/-		36/-	
Ems	50		7/-		27/6		50		8/-		30/-	
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NOTE ON KAMALA.*

BY WILLIAM KIRKBY, PH.C.

Kamala was not known in Europe as a drug until a very recent period. Before the year 1852 the only account of it is in the writings of Anslie, Roxburgh, Royle, and Buchanan. In that year, however, Port-Surgeon Vaughan met with it in the bazaar of Aden under the Arabic name of *wars*. Specimens obtained by him were forwarded to Mr. Daniel Hanbury, together with information concerning the same. The following information collected by him is found in his 'Notes on Drugs observed at Aden, Arabia':†—"*Wurrus* or *warus* is a red powder used chiefly as a dye. It is the produce of a plant resembling sesame. The plant rises to about 5 feet in height, bearing several separate bunches or clusters of small round seeds, which are covered with a description of flour; this, removed by gentle rubbing, constitutes the dye. Two kinds come into the market. The best comes from the interior, principally from the towns of O Badan and Gebla, and the districts of Yaffaee and Sjibul Rudfan. The second kind, brought by the Somalis of the opposite coast, comes from Hurrer. The second quality is not so much valued, and does not realize the price of the kind which comes from the interior. A considerable quantity of the dye is exported to Bombay, being used at Surat by ladies for dyeing silk a light brown-yellow. The Arabs use it as a dye and as a medicine, internally, for leprosy, and externally, in solution, for freckles and pustules. Much of it finds its way to the Persian Gulf, being known as *asberg*." Dr. Vaughan goes on to say that the best quality sells for 24 rupees the maund, while the African variety sells for only 17 or 18 rupees the maund.

Mr. Hanbury‡ states that he showed the specimens he had received to Mr. Alexander Gibson, of Bombay, who was at that time in London. Mr. Gibson suggested to him that it was obtained from *Rottlera tinctoria*. He then proceeded to compare the drug with specimens in the museum of the Linnæan Society, and found that Mr. Gibson was correct in his surmise.

Kamala, as found in commerce, is a fine, mobile powder, of a dull red colour. Under the microscope it is seen to consist chiefly of translucent, bright red granules mixed with colourless stellate hairs. These hairs give the drug its dull appearance. The glands, Fig. 1, *a*, are spherical, rather

a *b*

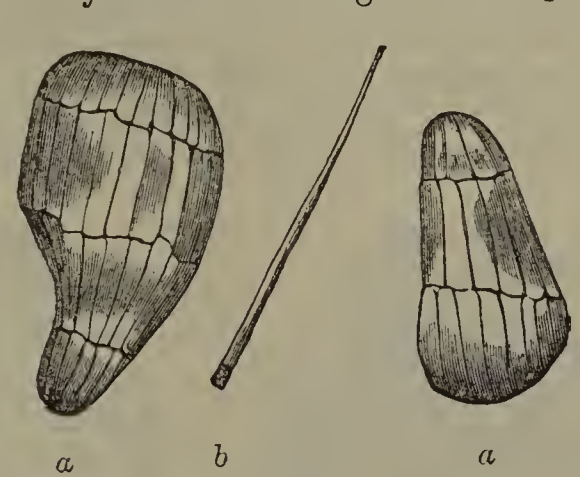
Fig. 1.
a. Gland of genuine kamala.
b. Stellate hair of the same.

irregularly so. Their diameter is from 70 to 120 mkm. (micromillimetres). They are flattened on one side, and are composed of a number of clavate cells enclosed in a pale yellow membrane. The cells are arranged in a radiate manner round a short stalk cell, which is not always visible, occupying the basal side of the gland. From ten to thirty of these cells may be seen on one side; the whole cell, however, contains from twenty to sixty of them. The cells are filled with a red resin, which is soluble in solution of caustic potash, alcohol, and ether. On treatment with solution of caustic potash the structure of the gland becomes plainly visible. On appropriate treatment, first with alcohol and afterwards with Schultz's solution or sulphuric acid and iodine, the cells are seen to be composed of cellulose, while the enclosing membrane is seen not to be cellulose.

Professor Flückiger* says that he examined authentic specimens from the Calcutta Gardens. These were taken from *Mallotus Phillipinensis* (*Rottlera tinctoria*), and he found them to agree entirely with the kamala of commerce.

From this it is plainly evident that the source of commercial kamala has been definitely settled.

Some years ago Messrs. Allen and Hanbury imported a remarkable kind of this drug from Aden. A full account will be found in 'Pharmacographia.' Mr. Hanbury forwarded a sample of this to Professor Flückiger, who submitted it to an exhaustive examination.† It differs from the ordinary variety in bulk, in having a *dark* red or violet colour. Microscopically examined it is at once seen to have quite a distinct structure. Solution of caustic potash dissolves the resin contained by the glands and the general structure is easily seen. The glands are cylindrical, somewhat conical, and are composed, like the other, of resin cells enclosed by a membrane. The arrangement of the cells will be best understood by reference to Fig. 2. The glands are



a *b* *a*

Fig. 2.
a. Glands of purple kamala.
b. Simple hair of same.

from 170 to 200 mkm. long and from 70 to 100 mkm. broad. The hairs mixed with them are simple and long, when compared with the short stellate hairs of the common kind. Professor Flückiger is quite sure the two kinds are not obtained from the same plant.

Dr. Dymock, in his 'Vegetable Materia Medica of Western India, says:—"'*Wurs*,' or '*wurrus*,' which differs from genuine kamala in being a dark purple colour, is the gland of the leaf of a leguminous plant, *Flemingia congesta*." He was not able to ascertain if it is collected in India or whether it is imported from Arabia. I have not had the pleasure of seeing Dr. Dymock's book; but it was the note, as above, which appeared in "The Month" of a recent number of the *Pharmaceutical Journal*, which first attracted my attention to kamala and its sources. Thinking it would be interesting to know if com-

* Read before the Manchester Pharmaceutical Association.
† *Pharm. Journ.*, [1], xii., 385.
‡ *Pharm. Journ.*, [1], xii., 589.

* *Pharm. Journ.*, [2], ix., 279.
† *Pharm. Journ.*, [2], vol. ix., 279.

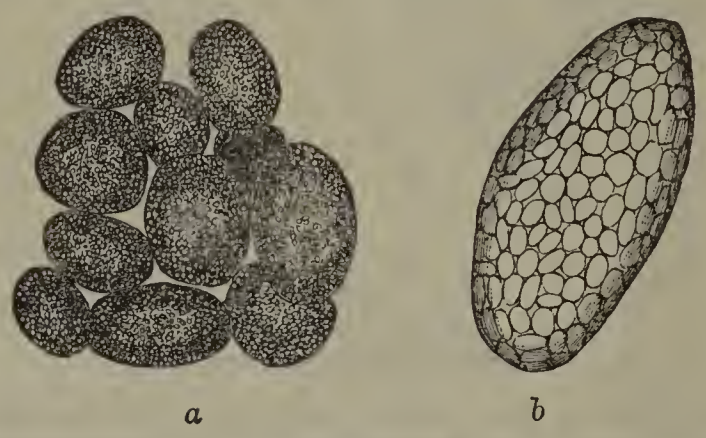
mercial kamala was entirely the produce of *M. Phillipinensis*, I obtained samples of the drug from various parts of the country. I find that everyone of the specimens obtained from dealers is genuine kamala.

Mr. E. M. Holmes, of the Pharmaceutical Society, has been kind enough to let me have samples of the specimens in the Society's Museum. The results of my examination are as follows:—

Sample marked "490 b," catalogued "Glands, covering fruit of *Rottlera tinctoria*," is genuine kamala.

Sample marked "490 c," catalogued "Wurrus, first quality," is identical with the purple variety examined by Professor Flückiger and is presumably the one referred by Dr. Dymock to *Flemingia congesta*.

Sample marked "490 d," catalogued "Wurrus, second quality."—This is totally different from either of the other two varieties spoken of. I have been unable to find any record of a third kind of this drug. I therefore venture to put before you a short description of this specimen. The glands are from 50 to 170 mkm. long, and from 50 to 100 mkm. broad. When seen with the microscope in a dry state they are translucent and but faintly coloured yellow. In form they vary very considerably; in fact, there appears to be no prevailing form. They impart but little colour to ether, alcohol, or solution of caustic potash. The cells are devoid of any such resin as is seen in the other two kinds. In solution of caustic potash they swell considerably, and their structure is rendered clearly visible. They consist of a mass of cells, composed of cellulose, enclosed by a non-cellulose membrane. The cells are not arranged in any particular manner. The general arrangement is shown, when seen in solution of potash, in Fig. 3, *b*. The hairs are similar to those found in the purple variety, being quite simple.



a *b*

Fig. 3.

a. New (?) variety of kamala seen dry.
b. The same seen in solution of caustic potash.

On drawing Mr. Holmes's attention to this unknown (?) variety, he informed me that he believed it was the *second* kind mentioned by Dr. Vaughan in his 'Notes,' and this sample was probably given by him to Mr. Hanbury, who presented it to the Museum.

I trust that some further information regarding the plants yielding the second and third varieties of "wurrus" will soon be forthcoming.

Looking at the last sort from an economic point of view, it would appear to be worthless as a dye, whatever it may be as a medicine.

In conclusion, I beg to tender my thanks to Mr. Holmes, and to Mr. Elborne who has assisted me in obtaining specimens of the drug.

THE MATERIA MEDICA OF THE NEW PHARMACOPÉE FRANÇAISE.

(*Continued from page* 839.)

N.

The articles omitted are Narcisse des prés, Nard celtique, Nicotiane rustique, Nigelle des champs. Those marked with an asterisk are Neroli ou Essence de Neroli and Nicotiane ou Tabac. The only alteration consists in the reference of the Bitter orange to the "Rutaceæ-Aurantiaceæ."

O.

The following are no longer official:—Orobe (*Orobus vernus*, L.), Orpin ou Reprise (*Sedum Telephinum*, L.), Ortie brulante (*Urtica urens*, L.), and Ortie dioique. Those marked with an asterisk are Orge (*Hordeum vulgare*, L.), Origan vulgaire and Ortie blanche ou Lamier (*Lamium album*, L.). The only addition is Orme fauve (*Ulmus fulva*, L.), the bark of which is better known in this country as slippery elm bark.

Opium.—This is said to be derived from *Papaver somniferum*, L., var. *album*, and to be the produce of Anatolia. This is scarcely correct, as the purple-flowered variety *β glabrum* is largely used in Asia Minor for the production of opium. Opium for pharmaceutical use should now yield when dried at 100° C. 10 to 12 per cent. of morphia and should afford about 50 per cent. of extract.

P.

Under this heading are omitted Pareira brava, Pavot noir, Pavot œillette, Pignon doux (seeds of *Pinus Pinea*, L.), Piment de la Jamaïque, Pin de la Caroline (*Pinus palustris*, Lamb.), Pin maritime, Poirée ou Bette, Poivre long, Polygala amer, Pomme de terre ou Parmentière, Pommier cultivé, Pouliot des montagnes (*Teucrium*, sp.), Pourpier cultivé (*Portulaca sativa*), Prêle d'eau (*Equisetum fluviatile*, L.) and Prêle d'hiver (*E. hiemale*, L.) Primevère (*Primula veris*, L.), and Pyrole ombellée.

The articles marked with an asterisk are Pariétaire (*Parietaria officinalis*, L.) Patience, Pensée sauvage (*Viola tricolor arvensis*, DC.), Pervenche grande et petite (*Vinca major* and *V. minor*, L.), Petit houx ou Fragon épineux, Pin sauvage, Poix de Bourgogne, Poix resine, Polygala de Virginie, Polypode commune. *Podophyllum peltatum* is the only addition under "P." It is placed in the *Berberidaceæ-Podophylleæ*.

Panama (Bois de).—This name now appears to be applied to *Quillaia*, as it is referred, with a note of interrogation, to *Quillaia Saponaria*, while *Quillaia savonneux* is omitted under "Q."

Patience (Racine de).—*R. obtusifolius*, L., and other species are now given as sources of this root, which in the last edition was described as Patience sauvage.

Pêcher.—The botanical name of the peach is now given as *Prunus Persica*, Mill., and the tree is referred to *Rosaceæ-Pruneæ*.

Persil.—The botanical name of parsley is now given as *Apium* (*Petroselinum*) *sativum*, Hoffm., and the leaves are no longer official.

Petit houx ou fragon épineux.—The natural order is now given as *Liliaceæ-Asparagineæ* and the official part is described as "souche" instead of rhizome.

Pin sauvage.—The young shoots commonly but

wrongly, designated *Bourgeon de Sapin* are now official.

Poix de Bourgogne.—*Pinus Abies* is the botanical name now adopted.

Q.

Quintefeuille (*Potentilla reptans*, L.), is the only article omitted.

Quinquina Calisaya and Quinquina gris de Loxa only are marked with an asterisk.

Quinquina Calisaya.—Both the flat and quilled barks are official. Under the latter head the Java barks, known as *Ledgeriana* and *Javanica*, are apparently included. It is, however, almost useless to direct the flat bark to be employed, since the genuine flat *Calisaya* bark can scarcely be met with in retail trade. Barks which yield less than 25 per 1000 of crystallized sulphate of quinine are to be rejected. Barks which are rich in quinine, but which give bad officinal preparations, such as *Quinquina Pitayo* and *Q. lancifolia*, are to be reserved for the extraction of quinine.

Quinquina gris Huanuco.—This bark may now be obtained from *Cinchona micrantha*, R. P., *nitida*, R. P. and *peruviana*, How.

Quinquina gris de Loxa may be the produce either of *Cinchona officinalis*, L., or of *C. crispa*, Tafalla, and should contain at least 15 per 1000 of salifiable alkaloids, of which one-tenth should be quinine. The Indies, especially those belonging to England, are indicated as yielding these barks rich in alkaloids.

Quinquina rouge.—Both the flat and quilled barks are official, preference being given to the Dutch and English Indian quilled barks. Red bark should yield at least 30 per 1000 of the sulphates of the alkaloids of which at least 20 should be sulphate of quinine.

R.

Rhus radicans and *R. Toxicodendron*, Roquette cultivée (*Eruca sativa*, Lamk.), Roquette sauvage (*Brassica Erucastrum*, L,), Rose trémière (*Althæa rosea*, Cav.), and Rosier sauvage (*Rosa canina*) are omitted.

Raisin secs, Ratanhia, Réglisse, Rhubarbe de Chine, Riz, Romarin, Ronce sauvage (*Rubus fruticosus*), Rose à cent feuilles, Rose rouge (*Rosa gallica*, L.) and Rue are marked with an asterisk.

Ratanhia.—Under this name the root of two species is official, viz., Peruvian, and Savanilla or New Granada Rhatany. The latter is referred to Krameria (*Ixina Granatensis*, Pl. and Tr.), but the description given, "un brun pourpre sombre ou violacé," would seem intended to include the Pará rhatany (*Krameria argentea*, Mart.).

Réglisse.—The rhizome, as well as the root, is now official.

Rhapontic.—Rhubarb under this name, derived from *Rheum Rhaponticum*, L., and other species, is to be used exclusively in veterinary medicine.

Rhubarbe de Chine is described as the "tige et souche" of *Rheum officinale*, H. Bn. and of some other species, more particularly *Rheum palmatum*, Maxm., *Tanguticum*, L. The description given does not apply to the root of *R. officinale*, Bn., as cultivated and prepared in this country, but to the greater portion of the root imported from China.

Rose rouge ou Rose de Provins.—The buds are now directed to be deprived of the calyx.

S.

The articles omitted are Sagapénum, Sanicle, Saponaire d'Orient (*Gypsophila Rokejeka*, Del.), Sauge sclarée ou Orvale, Saxifrage grande ou Boucage (*Pimpinella magna*, L.), Schœnanthe de l'Inde, Schœnanthe officinal, Séséli de Marseille (*Seseli tortuosum*, L.), Soude commune (*Salsola Soda*, L.), Succin ou Karabé, Sumac des Corroyeurs (*Rhus coriaria*, L.), Surelle ou alleluia (*Oxalis Acetosella*, L.)

Those marked with an asterisk are Sabine, Safran, Sagou, L., Salsepareille du Mexique, Sang-dragon, Sangsue medicinale, Saponaire officinale, Sassafras, Sauge officinale, Scabieuse (*S. succisa*, L.), Scammonée d'Alep, Scille, Scolopendre, Scordium ou Germandé d'eau, Seigle ergoté, Semen contra, Séné, Squine (*Smilax China*, L.), Staphisaigre, Stramoine ou pomme épineux, Styrax liquide, Sucre de Canne and Sureau (*Sambucus nigra*).

Sucre de lait is the only new article.

Safran.—This is now attributed to *Crocus sativus*, L.

Salsepareille.—This is now said to be derived from a number of species of *Smilax*, the kind principally employed in France being La Salsepareille du Mexique, *S. Tuspan*, falsely called for a long time Honduras Sarsaparilla. It is said to be derived from *Smilax Medica*, Scht. et Cham.

Sandaraque.—This is now referred to *Callitris quadrivalvis*, Vent.

Santal rouge.—This is now referred to *Pterocarpus indicus*, W., with a note of interrogation, and to *Epicharis Loureiri* and *E. Bailloni*, Pierre. The remark in the last edition about a red resin, called dragon's blood, being obtained from *Pterocarpus indicus*, but which comes rarely into European commerce, is now omitted.

Saponaire officinale.—The stem as well as the root and leaf are now official.

Sassafras.—The wood instead of the root is now official.

Scrofulaire.—The root and flowering tops of *S. aquatica*, L., are now official, as well as those of *S. nodosa*, L.

Semen-contra, Semencine or Barbotine.—Under this name the young capitula of different species of *Artemisia*, *A. Cina*, Berg., *A. maritima*, *Stecheana*, Bess. (Stechmanniana?), etc., are official.

Séné.—*Cassia lenitiva*, Bisch., is adopted as the botanical source of Alexandrian senna, and *C. angustifolia*, Vahl., for Tinnevelly senna.

Serpentarie de Virginie.—*Aristolochia Serpentaria*, Guib., is still adopted as the official species, although the rhizome usually met with in commerce is that of *A. reticulata*, Nutt.

Simarouba.—*S. amara*, Aublet, is now given as the source of Simaruba bark.

T.

The articles omitted are Térébinthe du pin d'Amerique (*Pinus palustris*, Lamb), and Térébinthe du Sapin balsamifere (*Abies balsamea*).

Tacamahaca.—This is now said to be the produce of *Icica heptaphylla*, Aubl. This resin should be completely soluble in alcohol.

Tanaisie.—The name now adopted for the tansy is *Pyrethrum Tanacetum*, DC.

Térébinthe d'Alsace.—The tree yielding Strasbourg turpentine is now given as *Pinus Picea*, L.

Térébinthe de Bordeaux ou Térébinthe commune is referred to *Pinus Pinaster*, Sol.

Térébinthe de Venise is now said to be obtained from *Pinus Larix*, L., instead of *Abies pectinata*, DC., as in the last edition.

Térébinthe de Chio is described as being greenish-grey, cloudy, with a feeble odour of turpentine and fennel; a sweet taste, aromatic, incompletely soluble in alcohol, but completely so in ether.

Tilleul.—The flowers are now referred to *T. sylvestris*, L., and *T. platyphylla*, Vent., which, however, are not here given as synonyms of *T. Europæa*, L.

U.

Uva Ursi, Raisin d'Ours is now placed here instead of under Busserole, and is referred to *Arctostaphylos Uva-Ursi*, L.

V.

The articles omitted are Valériane celtique, Valériane phu, Vermiculaire brulante (*Sedum acre*, L.), Verge d'or (*Solidago Virga-aurea*, L.), Véronique (*V. officinalis*, L.), Vétiver, Vipère, Vipérine commune.

Valériane officinale and Vanille are marked with an asterisk.

Valériane officinale is the name now adopted for valériane sauvage.

Vanille is referred to *Vanilla planifolia*, Andr. Vaniller (*V. Pompona*), which is an article of commerce in France, is therefore not admissible for use in pharmacy.

W.

The bark of *Drimys Winteri*, var. *granatensis*, is now official instead of that of the typical form. It is described as occurring in curved or quilled pieces 5–8 millimetres thick, whitish and marked with brown spots on its outer surface, the transverse fracture of a brown red colour, with large white striæ, which are transverse in the outer, and radial in the inner layers. Taste aromatic, very bitter and very pungent.

In comparison with the United States and British Pharmacopœia, one cannot but be struck with the large number of simples still retained in the materia medica, many of which are relegated in this country to the domain of the herbalist.

The botanical nomenclature and descriptions bear evidence of hasty work, which is further supported by the number of typographical errors which still exist in this part of the Codex.

TO PREPARE CORROSIVE SUBLIMATE GAUZE.*

In the New York Hospital, corrosive sublimate is used almost exclusively as an antiseptic upon gauze or jute. The sublimated gauze is prepared by immersing the bleached material in a solution as follows: corrosive sublimate, 20 parts; water, 4·480 parts; glycerine, 500 parts, for twelve hours; then wringing out, and allowing to dry, as far as the glycerine will permit. At the time of operation, a sublimate solution (1 in 1000) is allowed to trickle slowly but nearly continuously over the incision. Bleeding vessels are tied with sublimated catgut. No impervious protective is used over the dressings, as, by retaining the moisture of the dressings and the sweat, it is thought to act too much as a poultice. Metallic instruments must be immersed in a 5 per cent. carbolic solution, as the bichloride will form an amalgam with them. In New York Hospital, not only is the part to be operated upon washed with soap and water, but also with turpentine and alcohol, two ounces to the pint.

* From the *British Medical Journal*, April 5.

VALUATION OF GELATIN.*

BY F. PROLLIUS.

The author has determined the amount of ash, water and insoluble matter (residue insoluble in hot water) in various kinds of gelatin. To ascertain the gelatinizing property 1 part of the sample was dissolved in 90 parts of water, filtered, and the degree of viscosity determined.

	Ash.	Water.	Insoluble.	Time required for the solution to run out.
	p.c.	p.c.	p.c.	seconds.
Astracan from Schmidt and Dihlmann, Stuttgart	0·20	16·0	2·8	507
Ditto, from a collection.	0·37	18 0	0·7	485
Ditto. fine iridescent Russian quality, Tubingen collection	1·20	17·0	1·0	500
Ditto, Russian, from Gehe of Dresden	0·80	19·0	3·0	491
Ditto, in laminæ, from Gehe	0·50	19·0	0·4	480
Ditto, in threads, known as Hamburg threads	0·40	17·0	1 3	477
Hamburg isinglass	1·30	19·0	2·3	470
Another quality	0·13	19·0	5·2	—
Rolled northern fish bladder	3·20	1·5	10·8	467
Icelandish bladder	0·60	17·0	21·6	463
Indian isinglass	0·78	18·0	8·6	437
Yellow, quality unknown	2·30	17·0	15·6	360

To judge of the purity of isinglass, it is also recommended to subject the sample to microscopic examination.

MANGANESE VARNISH.†

The manganese varnishes are prepared by the use of manganous oxide, manganic oxide, manganese peroxide, and specially manganese borate. The last named compound gives a varnish of such excellent properties that it must be preferred to all other substances used for the same purpose.

Manganese borate varnish is prepared in the following manner: 2 kilos perfectly dry, white manganese borate, free from iron, in very fine powder, are gradually stirred into 10 kilos linseed oil, which is heated in a suitable vessel. By continual stirring a uniform distribution of the salt in the oil is effected. The heating is continued until the temperature of the oil reaches 200° C. It is to be observed, that a good quickly drying varnish can only be obtained when the manganese borate is entirely free from iron.

1000 kilos of linseed oil are then heated in the varnish kettle, until it begins to bubble. Then the mixture of linseed oil and manganese borate is run in, in a thin stream, the fire is increased, and the mixture is heated to a violent ebullition. After about twenty minutes boiling, the varnish is ladled out, filtered, while still hot, through cotton, and is then ready for use. Slabs of wood, which were immersed into the hot varnish, were coated with a perfectly dry, glassy layer, in from sixteen to eighteen hours.

It was shown by experiment, that manganese borate has the property of converting linseed oil, at comparatively low temperatures, into rapidly drying varnishes; a temperature of 40° is sufficient. If a small linen bag, containing 30 grams of manganese borate is suspended in a 10 litre flask, filled with linseed oil, the latter when placed in a warm place, will be converted into a good drying varnish in ten to fourteen days.

* From the *Dingl. polyt. J.*, ccxlix., 425. Reprinted from the *Journal of the Chemical Society*.

† From *Metallarbeiter*. Reprinted from the *Oil, Paint and Drug Reporter*, April 23.

The Pharmaceutical Journal.

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THE ANNUAL REPORT.

IN accordance with the precedents of previous years the Council of the Pharmaceutical Society, at its meeting on Wednesday last, agreed upon the Report that should be presented to the members at the Annual Meeting on the 21st inst., and probably copies of it will reach the hands of many of our readers almost simultaneously with the present number of the Journal. We think it will not be taking a merely optimist view of the Report to say that, although some statements which might have been hoped for a few months ago will be found wanting, yet in respect to the regular business and progress of the Society the record which the Council is able to present of the past year's transactions is very satisfactory. It is undoubtedly disappointing that no apparent progress has been made towards securing ameliorative legislation, and that the Government has even declined to undertake the responsibility of introducing any Bill tramelled by provisions not directly relating to the sale of poisons. But such is the congestion of parliamentary business in the present session that the Government, with all its influence and notwithstanding repeated promises evoked by inquisitorial goadings, has not yet been able to introduce the Poisons Bill it is supposed to have prepared, and until this has been done it would be idle for the Council to approach Parliament with an independent measure. In the meantime the Council has not been unsuccessful in enforcing the present defective law. As many as one hundred and twenty cases of infringement have been dealt with, and in the majority of these the primary object—the compelling of the discontinuance of the illegal practices—has been attained without instituting legal proceedings, whilst in every case in which these have become necessary during the year the suit has been successful, and a penalty has been imposed. It may be remarked that this number probably by no means represents the whole of the complaints that have been received and investigated; but, judging by numerous communications that reach us, a large proportion of them would be concerning practices which, however objectionable, are not at present illegal, whilst others would contain complaints unsupported by evidence of the nature which is indispensable to success in proceedings in a court of law. Of minor importance, but not without its value to chemists and druggists in common with traders generally, was the service rendered by the Council in securing the modification of a clause in the Patents and Trade Marks Bill concerning the use of the royal arms, which might have been a source of vexation and trouble had it passed unaltered. A Medical Bill, also, has occupied the attention of the Council, not like its predecessors for what it contained, so much as for what it was deficient in, namely, a provision for the legal representation of pharmacists on any future Pharmacopœia Committee. The Council having failed by its representations to obtain this concession from the Department in charge of the Bill, is prepared to do its best to bring the unanimous wish of pharmacists in the most effective manner before the House of Commons should the Bill reach the stage of Committee.

In every other respect the Report shows that during the past twelve months the Pharmaceutical Society has enjoyed a fair measure of prosperity. The Financial Statement shows that the receipts from subscriptions have slightly exceeded those in the previous year, and that the income from all sources leaves a respectable balance over the expenditure. With many of the details in the Report relating to the Examinations, the Library and Museum, and the Benevolent Fund, our readers will already be more or less familiar, and they need not be further referred to here; but the opportunity may be taken to emphasize the compliment paid to those Local Secretaries who by their personal effort and perseverance contributed so much towards maintaining the stream of benevolence at the high level of the previous year.

Our pages this week also contain the Report of the local executive of the North British Branch, presented at the Annual Meeting of the members of the Pharmaceutical Society resident in Scotland, held last week in Edinburgh. It is satisfactory to find that the operations of the Branch continue to be carried on with success in all departments. One topic that appears prominently in this Report is the recent decision of the Council to acquire premises in Edinburgh more suitable to the requirements of the Society and its pretensions in Scotland than those at present occupied. It is evident that this step is much approved by the members of the Society living beyond the Tweed, and it may be hoped that the anticipation that it may lead to an immediate augmentation of the membership of the Society in Scotland will be fulfilled. In the course of the discussion upon the Report comments were made upon what was assumed to be an increased difficulty which had been introduced into the Preliminary examination coincidently with the enlargement of the time allowed to the candidates, and it will be observed that the subject was brought under the consideration of the Council at its meeting on Wednesday last. We are inclined

to think that an undue importance has been attributed to the portion of the examination to which objection has been raised. It only needs a glance at the questions on p. 871 to see that the English sentences which were set for translation into Latin at the last "Preliminary" were of so simple a nature that they should present not the slightest difficulty to a boy capable of giving a fair translation of the passages either from Virgil or Cæsar, since in the course of his studies he would necessarily have gone over the ground covered by these questions again and again. It is also worthy of note, as pointed out by Mr. GOSTLING, that Latin is not the subject in which the majority of failures in the Preliminary examination occur. At any rate no reproach can be cast upon the examiner who set the questions, since the Regulations distinctly specify the "translation of simple sentences from English into Latin." Still, it is well that such points should be discussed as they arise, with a view to the clearing up of doubts, and those who think that too great a stringency is exercised have the assurance of the President that if their objections are reduced to writing and forwarded to him he will take care that they receive due consideration.

A NEW READING OF THE PATENT MEDICINES ACT.

IT may be that others besides ourselves have been startled within the last day or two by reading a statement seriously put forward at some length in the editorial columns of our contemporary the *Medical Press and Circular*, to the effect that no single day passes in the experience of a chemist transacting an ordinary retail business without his being guilty of transactions for which he exposes himself to fines amounting in the aggregate to, possibly, thousands of pounds. If this were true it would indeed be a serious discovery; but it cannot be said that the adjective "serious" is quite the one most applicable or it. In fact the article is a fresh illustration of the truth that "a little learning is a dangerous thing." Moved by the "persecution" which our contemporary considers to have been involved in a recent enforcement of a law to the somewhat arbitrary application of which retail chemists and druggists have had to submit for many years past, the *Medical Press and Circular* took up the study of the Act under which stamp duties are levied upon "patent medicines," and arrived at the startling conclusion that stamp duty is chargeable upon all "preparations whatsoever to be used or "applied externally or internally as medicines or "medicaments, for the prevention, cure, or relief "of any disorder or complaint incident to or in "any wise affecting the human body, made, pre-"pared, uttered, vended, or exposed to sale by any "person or persons whatsoever." Being under this impression our contemporary sees an imaginary danger threatening chemists in that "any one of "the class may, to-morrow, be summoned for "selling to an informer a pennyworth of sper-"maceti ointment," and fears that even a medical practitioner dispensing his own prescriptions is liable to be brought under the penal clauses of the Act, unless he retains a supply of stamps "ready for affixing to each bottle or box that leaves his surgery." Indeed, our contemporary appears to have completely misread the remainder of the paragraph quoted, according to which the essence of the liability to stamp duty consists in the medicine or preparation being put forward as a secret, patent or proprietary article, or being advertised in any way as being beneficial in the prevention, cure or relief of any ailment affecting the human body. This may be easily illustrated by the case which has excited so much of our contemporary's sympathy. Unless we are greatly in error, a mixture of menthol and wax might have been sold as such, to any extent, without the seller being liable to pay one penny of stamp duty; but as soon as the mixture had once been advertised to the public, in newspaper, hand-bill, label, or any other medium, as capable of relieving headache, the conditions were changed, and the stamp duty became chargeable on every separate quantity sold. We have referred to this subject at somewhat greater length, perhaps, than it deserved, because the article in our contemporary is capable of disturbing effectually the equanimity of any nervous chemist and druggist who may read it, and not have a sufficient cognizance of the Act, 52 Geo. III. c. 150, to enable him to perceive the error. Otherwise the mistake would be almost too grotesque for serious discussion, for we are quite able to agree with one opinion expressed by our contemporary, that "the ludicrous side of the subject is as prominent as the grave aspect of it."

The Annual Dinner of the North British Branch took place in the Royal Hotel, Edinburgh, on Tuesday evening, April 29, Mr. Nesbit, President, being in the chair and Mr. Gilmour, Croupier. In responding for "The Pharmaceutical Society of Great Britain," Messrs. Borland and Young made very stirring speeches in reference to the position of the Society in Scotland and the acquirement of new premises. Mr. Borland, in strongly urging members to use their personal influence to get others to join the Society, gave a sketch of the present membership and showed in what directions it might be increased. The gathering was numerously attended and was an exceedingly harmonious and successful one.

* * *

It appears from a circular sent out by the secretary of a provincial association that a statement has been made by the local inspector of weights and measures to the effect that an Order of the Board of Trade has been received by him requiring that all chemists' measures shall have their denominations marked on them, and that symbols alone shall not be allowed. We are in a position to state that no such "Order has been issued, the fact being that the

Board of Trade has no power under the Weights and Measures Act to take such a step. We understand, however, that it is the opinion of the Standards Department that apothecaries' measures should have their denominations marked on them "in legible figures and letters," as this appears to be required by the Act of 1878, and this opinion was indicated in the "Suggestions" as to the testing of apothecaries' graduated glass measures and apothecaries' weights which were issued to inspectors in May, 1881.

* * *

In reply to a question put by Mr. Warton in the House of Commons on Thursday, as to when the Government intended to introduce into the House of Lords the promised Bill on patent medicines, Mr. Mundella said that the Sale of Poisons Bill, which would deal with this subject, would be ready in a few days.

* * *

In accordance with an intention intimated at a recent Evening Meeting, Mr. Giles has given notice of a motion which he will propose at the Annual General Meeting of the Pharmaceutical Society, to the effect that the Council be requested to consider the best means of promoting systematic research, having for its primary object the initiation, examination and improvement of formulæ for the national pharmacopœia.

* * *

We think it may be useful to repeat here that tickets for the Annual Dinner should be obtained from the Honorary Secretary, Mr. Richard Bremridge, on or before Saturday, the 17th inst.

* * *

At a recent meeting of the Paris Pharmaceutical Society a commission was nominated, consisting of Messrs. Petit, Ferrand, Portes, Thibault and Champigny, and entrusted with the duty of bringing under the notice of the Minister "the numerous errors and omissions of the new Codex." The Commission has issued an appeal to all *pharmaciens* for assistance and requesting that suggestions may be made to the President, M. Petit.

* * *

The next meeting of the Chemical Society will be held on Thursday, the 15th inst., when the papers read will be:—"On the Indices of Refraction of Organic Substances," by Dr. J. H. Gladstone; "On Fluorene Derivatives," by Mr. W. R. E. Hodgkinson; and "Some Minor Researches on the Action of Ferrous Sulphate on Plant Life," by Mr. A. B. Griffiths.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, May 15, at 8 p.m., when papers will be read on the "Botany and Materia Medica of Linseed," by Mr. E. H. Earle; on the "Chemistry of Linseed," by Mr. E. Cullinan; and on the "Separation of Cobalt and Nickel," by the Reporter on Analytical Chemistry, Mr. C. Thompson.

* * *

The Annual General Meeting of the Chemists' Assistants' Association will be held at 53, Conduit Street, on Wednesday, May 14, at 9 p.m. precisely, when the report for the past session will be read and the Council for the ensuing year will be elected.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 7, 1884.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Robbins, Savage, Schacht, Symes, Williams, and Young.

The minutes of the previous meeting were read and confirmed.

The Late Mr. Squire.

The PRESIDENT said he could not commence the business of the day without referring to the loss sustained by the Society and by all British pharmacists, in the death of one its Founders and past Presidents, Mr. Peter Squire. It would be scarcely possible to find anyone who could speak of him as one who had laboured so long should be spoken of, from personal experience. He, himself, had known Mr. Squire for something like twenty years, first as an examinee, afterwards as a colleague on the Board of Examiners and as a member of the Council, and those who, like himself, had had the honour of working with him during the later years of his life must have been struck by the wonderful activity and keenness of perception he always showed. It was a marvel to his younger colleagues to find so much energy and fire in a man whose life had been one of such unceasing activity. The fact that he had departed with the honour and glory of a ripe old age made the reference to his death le-s saddening than it otherwise would be. Not many could expect to reach the age of eighty-six and few could expect to do the vast amount of work which Mr. Squire achieved during even the last twenty years of his life. He might further say, knowing something of the opinions held of Mr. Squire in the outside world, social and otherwise, that no man could be more correctly described as a typical pharmacist; and the respect in which he was held outside the Society's house was an indication of the honour which he had, by his labours, conferred on pharmacy. He would move the following resolution:—

> "That the Council wishes to express to Mrs. Squire and her family its most sincere sympathy at the loss which they have sustained in the death of Mr. Peter Squire, one of the Founders and past Presidents of the Society, and to convey an assurance of the high esteem in which he was held by the Council for the valuable services which he rendered to pharmacy and to the Pharmaceutical Society."

The VICE-PRESIDENT, in seconding the motion, said he had not had the advantage of knowing Mr. Squire as intimately as those resident in London, but he had been acquainted with him for the last thirty years, and he ventured to think that no name in the country was better known, since his 'Companion to the Pharmacopœia' was on the shelves of almost every pharmacy.

The motion was carried unanimously.

Diplomas.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Ashton, Frederick William.
Cule, Taliesin.
Dobson, George Turner.
Granger, Harold.
Jones, Morgan Isaac.
Luxmoore, Charles Mann.
Marshall, Sam.
Milford, James Emery

Neve, Annie.
Spilsbury, James
Wood, John

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Ashton, Frederick William ...Chertsey.
Austin, Alfred .....Bournemouth.
Corder, Walter Shewell .....Kendal.
Cule, Taliesin .....Pontypridd.
Granger, Harold ....Hucknall Torkard.
Houfe, Robert William .....Bradford.
Jones, Morgan Isaac ....Trecynon.
Luxmoore, Charles Mann .....Bristol.
Marshall, Sam .....Hyde.
Milford, James Emery .....Manchester.
Neve, Annie .....Eastbourne.
Puckey, Courtenay .....Stanstead.
Selkirk, James.....Cork.
Spilsbury, James .....Leamington.
Wood, John ....Leighton Buzzard.

Chemist and Druggist.

Job Preston, of Sheffield, who was registered as having been in business on his own account before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society.

Aspinall, William .....Platt Bridge.
Atkinson, Charles Henry .....Heckmondwike.
Attwood, Henry Ernest .....London.
Bain, John.....Liverpool.
Bates, Edward .. .. Brackley.
Bennison, Richard .....North Ormesby.
Bostock, Thomas Henry.....Eastwood.
Cardwell, Augustus.....Ossett.
Coates, Udolphus Aylmer .....Walsall.
Doubleday, Frederick William..Dorking.
Dow, William .....Kinross.
Gilkes, Frederick George .....Banbury.
Grant, Thomas.....Clevedon.
Green, William James.....London.
Hands, Henry Joseph.....Chipping Campden.
Harrison, Jeremiah .....Blackburn.
Hedley, Charles Alfred .....London.
Hendry, Robert Love .....Edinburgh.
Hodgkinson, Peter James .....Manchester.
Hudson, William.....Sunderland.
Illingworth, George Skeen .....Glasgow.
Jarvis, Clarence Frank .....Birmingham.
Jenner, Charles Samuel .....London.
Jones, George .....London.
Keith, John .....Newton Stewart.
Kemp, Herbert William.....Horncastle.
Kerr, William .....Dunfermline.
Lambert, John Thomas .....Wombwell.
Lees, James .....Watford.
MacNeilage, Alexander .....Greenock.
Masters, Henry James .....Bath.
Maxey, William Henry .....Sheffield.
Perkins, Thomas James .....Ealing.
Pitts, William Christopher.....Norwich.
Price, Henry Thomas .....London.
Richards, Jonah Palmer .....Carmarthen.
Riddiough, Fred. .....Keighley.
Rigg, George Farrer .....Kendal.
Rogers, Oliver ....Tunbridge Wells.
Roughton, William .....Leicester.
Rowand, Robert .....Liverpool.
Savage, Frederick George .....Nottingham.
Shackleton, Thomas.....Accrington.
Tansley, Arthur James .....Kidsgrove.
Thomas, James Philip.....Cheltenham.
Thomas, Joseph Arden .....Cheltenham.
Townsend, Joseph Edward.....Long Sutton.
Wall, Edward John .....London.
Warburton, Edward .....Farnworth.
Watkinson, James .....Little Hulton.
Watson, Robert John .....Caistor.
Webster, George Samuel G. ...Ilkeston.
Wellington, Frederick.....Taunton.
Wingrave, Arthur .....London.
Wooldridge, Elijah .....Cradley Heath.
Wright, Edwin.....Hadleigh.
Young, Robert John .....Banwell.

Modified.

Gall, Frederick.....Landport.
Haywood, Charles .....Liverpool.
Higham, Thomas.. .....Lewes.
Jones, William James.....Mitcham.
Slack, Josiah William.....London.
Turpin, Alfred Barritt .....Chippenham.

ASSOCIATES.

The following, having passed their respective examinations and tendered (or paid as "Apprentices or Students") their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Atherton, Henry Charles .....Tunbridge Wells.
Atkinson, William George .....Ulverston.
Barlow, George Robert .....Congleton.
Barratt, William .. ..King's Lynn.
Blackburn, Albert Edwd. Hy...Eccles.
Blyton, Thomas Bage .....Manchester.
Burgess, Thomas .....Liverpool.
Callaway, George Frederic .....Ipswich.
Cappell, Robert .....Crieff.
Carter, Benjamin .....Falmouth.
Chifney, George Pearmain.....Mildenhall.
Cooper, Albert .....Huntingdon.
Coull, George .....Edinburgh.
Davies, William ....Newcastle Emlyn.
Deck, Arthur Albert .....London.
Dunn, George Marchant.....London.
Dunn, Isaac George.....Chard.
Eastes, Ernest John .....Deal.
Edgar, Frederick George .....Southsea.
Evans, Daniel Thomas .....Llandyssul.
Fowle, Sydney .....London.
French, Herman .....Milton next Gravesend.
Freshney, John Wm. Septimus.Lincoln.
Golding, Frank Oliver .....London.
Groves, Thomas .....Bridport.
Guest, George Robert .....Brentwood.
Hacon, Elizabeth Constance ...London.
Hodgson, George ....Doncaster.
Hallawell, Joseph Lefebvre ...Ayr.
Harrison, Thomas .....Birmingham.
Hickley, Arthur Mackenzie ...London.
Jackson, John Thomas .. .. Scotforth.
Jefferson, John Mitchell.....Southport.
Jenkins, Thomas .....Aberdare.
Kirby, Herbert Edward .....London.
McDiarmid, Fraser .....Deal.
Madge, Thomas William.....Shaldon.
Marlar, John Frederick .....Halstead.
Mathias, James Russell Henry.Tenby.
Miller, William Henry .....Howden.
Mitchell, William Kirkpatrick..Wigton.
Nickolls, John Bate.. ....Bromsgrove.
Owen, John .....Sheffield.

Pierce, Robert Wynne Chas. ...Bangor.
Rennie, William .....Dumbarton.
Ridley, Henry .....Ipswich.
Roberts, Robert .....Llangynider.
Robertson, George .....Burntisland.
Robinson, Richd. Fredk. Wm...Manchester.
Scholes, William Isaac .....Pendleton.
Skoulding, William George ...Oakham.
Smith, Albert .....Stalybridge.
Smith, Joseph de Carle .....Norwich.
Spurway, Edgar .....Kidderminster.
Stewart, Robert McAll .....Penryn.
Taylor, John Williams .....Norwich.
Tennant, Alfred .....Lancaster.
Timbury, Alfred Jefferies .....Leominster.
Tugwell, Ernest Harry .....Greenwich.
Walker, James.....Lanark.
Wookey, Edgar.....Bristol.

Modified.

Bassett, John .....Leominster.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Arrandale, James William .....Denton.
Aslin, William .....Sunderland.
Aspinall, Hortensius .....Liverpool.
Austin, James ....Birmingham.
Baker, Alfred John E. .....St. Austell.
Bax, Robert William .....Rawtenstall.
Beck, John Frederick .....Honiton.
Bullock, James .....Uttoxeter.
Carron, Herbert Burgess.....Leyton.
Clark, James ....Thornhill.
Cook, Alfred Edward .....Landport.
Crabtree, Edmund .....Rawtenstall.
Crosdale, Robert Morgan .....Oldham.
Davy, John Thomas.....Plymouth.
Duncan, John G. B.....Gainsborough.
Emery, Alfred .....London.
Evans, Alfred Philip .....London.
Freke, Cecil Henry ... .Shaftesbury.
French, Montague Robert .....Gosport.
Fuge, Harry Dixon .....Matlock Bath.
Funnell, Richard .....Whittlesea.
Gaddes, Andrew .....Penrith.
Gartside, Charles .....Oldham.
Gibson, Horton John .....Grantham.
Govan, John Wallace .....St. Andrews.
Greenwood, William Russell ...Howden.
Harding, Charles Thomas .....London
Haynes, Alexander .....Fleetwood.
Holt, James Hartley .....Ormskirk.
Honman, Alfred Taylor .....London.
Limbrick, James Alfred .....London.
London, Walter Augustus .....Redditch.
Massey, Samuel Jeffrey .....Preston.
Middleton, Richard Watson ...Ilkley.
Moyse, Arthur .....Fareham.
Oldfield, William .....Denton.
Orme, Alfred .....Knutsford.
Roberts, Thomas .....Llanfyllin.
Scowby, Joseph Newsome .....Sheffield.
Stansfield, John Mills.....Birkdale.
Stewart, Hawthorn .....Ayr.
Streatfield, Edward Henry.....Maidstone.
Street, Herbert.....Lincoln.
Sweetapple, Thomas Pyke .....Taunton.
Thomas, Henry Owen .....Rhyl.
Tupholme, John James .....Spilsby.
Turpin, Ernest .....London.
Tweedie, Thomas Shortridge ...Annan.
Walker, William Henry .....Willenhall.
Webster, Thomas Findlater ...London.
Werner, Emil Alphonse .....Dublin.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

THE PRELIMINARY EXAMINATION.

Mr. BORLAND asked if a failure in the translation of English into Latin militated against the success of candidates at this examination.

The PRESIDENT replied that he did not think it did, or only partially. It was used by the examiner mainly to see that the candidates did not translate Latin into English by learning by heart an English edition of the author.

Mr. BORLAND said the question was broached at a meeting recently held in Edinburgh, and reference was made to what seemed to be an innovation, to a certain extent, viz., that the English sentences for translation contained words which were not to be found in the Latin sentences which were given for translation. At the time when he was connected with the Board of Examiners in Scotland, a discussion took place on this practice, and it was only agreed to on the understanding that the English words which had to be translated were to be found in the Latin sentences,—not the individual words, of course, but the root, so that the student would only have to put it into the right case, mood or tense, as the sentence required. It was considered that it would be a hardship on the candidates to have to spend a considerable amount of time searching for the Latin word best suited to express the meaning.

The PRESIDENT thought Mr. Borland was rather confusing parsing with translating.

Mr. BORLAND said he thought not.

The PRESIDENT said the examination paper contained first a piece of Latin to be translated into English, from Cæsar or Virgil; and then there were a few little sentences in English to be put back into Latin, besides the parsing.

Mr. BORLAND said he referred entirely to translating English into Latin; and it was considered at the time of the discussion he referred to, that in giving sentences of that kind, the words in the English sentence should be found in the Latin passage which was given for translation into English, in some form or other. In looking at the sentences given at the time he found such was the case, but this was not so on the last occasion.

The PRESIDENT thought the words given were to be found in the author, and in that part of the book which the candidate had to study.

Mr. BORLAND was not quite sure of that.

Mr. WILLIAMS suggested that this matter was one rather for the Board of Examiners than for the Council.

Mr. BORLAND said his main point was whether a failure in this matter would tell against the candidate, and he thought this ought to be known, because otherwise a candidate might spend a great deal of time on one subject and so hardly do himself justice in others.

Mr. HAMPSON thought Mr. Borland was quite right in calling attention to the subject, which was considered a grievance.

Mr. YOUNG said the same view had been put forward by Mr. Borland when the question was discussed by the Board of Examiners in Scotland. He did not himself see that it made much difference that the exact words were not found in the sentences given, if they were in the book.

Mr. SYMES remarked that as the subjects were divided into three parts, and the matter in question came at the end of the Latin portion, the candidate would not spend extra time over that until he had finished the other portion. But he could not see how a failure in this subject would not tell against him; if it were so, what was the use of introducing it? The candidate was supposed to have at his fingers' ends the power of translating any portion of the particular book selected. It would be well for Mr. Borland to ascertain the exact sentences which

were given, and if they were not found in the book selected he should support him.

The PRESIDENT said the examination had for some years been in the hands of the College of Preceptors, which body had had large experience, and he thought the Council would not like to interfere with it in any way. He remembered being told by an examiner of the College that the translation of these sentences into Latin was a distinct gain to the candidates. The object of the examination was to ascertain that the candidate had such a knowledge of elementary Latin as should enable him to become a fair translator of prescriptions by-and-by. Some young men might make a very slovenly translation of a paragraph from Cæsar or Virgil, and yet might do very well with these little sentences. He hoped Mr. Borland would give the College of Preceptors credit for providing the candidate the best opportunity of showing his general knowledge of elementary Latin.

Mr. BORLAND said that was his own idea entirely. He thought it was one of the best tests a young man could be subjected to, to translate English into Latin, but it was in his opinion a hardship on the candidate to have to search for the words required.

The PRESIDENT thought it was in a great degree a matter of individual judgment.

The VICE-PRESIDENT differed from Mr. Borland entirely, and thought it highly desirable that the candidates should show a knowledge of Latin words.

Mr. ANDREWS thought the sentences set were exactly of the same character as those in Smith's 'Latin Course.'

Mr. CHURCHILL thought it was a great mistake to lead candidates to suppose that this translation into Latin would not count against the candidate. If a man pretended to know anything of any language he ought to be able to translate into and from it with equal facility.

Mr. SCHACHT said the Council ought to take the sole responsibility of these examinations on itself and not throw it on to the examiners. The regulations laid down plainly included the translating of English sentences into Latin, and did not prescribe that they should be taken from the same book as the other Latin examples. They might occasionally differ as to the selection of any particular sentence, but that must be left to the examiner's judgment.

Mr. GOSTLING remarked that as a rule Latin was not the subject in which candidates failed.

The PRESIDENT said there was a very large margin allowed, within which a candidate was permitted to pass, and the examiners, who were experienced men, were ready to make all fair allowances.

Mr. SAVAGE suggested that if the Board of Examiners in Scotland had any suggestions to make it should communicate with the Board of Examiners in England, so that, if possible, they might agree.

The PRESIDENT said it had been shown by Mr. Schacht that the examination was quite within the regulations laid down by the Council, but if Mr. Borland or any other member had any ideas or suggestions with regard to the examination and would let him have them in writing, he would take care they should be submitted to the College of Preceptors. He had, from time to time, received letters from members containing observations on the examinations, derived from the experience of their sons, which he had submitted in this way, and such communications the College of Preceptors was always glad to receive.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was received and adopted, and various accounts were ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£15 to the widow (aged 53) of an annuitant and member from 1842 to 1870, and subscriber to the Fund. The husband died in January last; applicant is suffering from inward tumour, and is dependent on her children for support. Middlesex.

£15 to a former pharmaceutical member, 1841 to 1851, and subscriber to the Fund, aged 73. Applicant was in business for forty-six years, but in consequence of his ill-health, the business gradually dwindled away. Devonshire.

£5 to the widow of a registered chemist and druggist, aged 63. Applicant had a grant of £5 in July, 1879. Is now in ill-health and with no friends who can assist her. Yorkshire.

Two other cases had not been entertained by the Committee.

The Secretary had reported that members and subscribers in various parts of the country had written and sent him letters they had received asking for pecuniary assistance.

The Committee expressed a hope that all such cases should be referred to the Secretary, so that proper investigations might be made.

The VICE-PRESIDENT, in moving the adoption of the report, desired to draw special attention to the last paragraph.

The report and recommendations were unanimously adopted.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
March	Day	436	26	9	17
	Evening	181	20	3	8

Circulation of books.	No. of Entries. Town.	Country.	Total.
March	176	134	310

Carriage paid, £1 14*s.* 6*d.*

The undermentioned donation to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the donor:—

Gay (F.), Essai d'une Monographie locale des Conjuguées, 1884.

The Committee recommended the purchase of the undermentioned works for the Library:—

Flückiger (F. A.), Cinchona Barks, pharmacognostically considered, translated by F. B. Power.

Moens (J. C. B.), Cinchona Cultivation in Asia from 1854 to 1882.

Mueller (F. von), Eucalyptographia, decades 1 to 5, and 7 to end.

The Committee approved of the purchase of the following:—

Berichte der deutschen chemischen Gesellschaft. Sundry numbers to complete vols.

Curator's Report.

The Curator had reported the attendances in the Museum during March to have been:—

	Total.	Highest.	Lowest.	Average.
Morning	582	40	5	19
Evening	148	16	1	4

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors and a special letter to Dr. Domingo Parodi:—

A collection of the indigenous drugs of Brazil and neighbouring countries, containing two hundred and fifty-seven specimens.
From Dr. Don DOMINGO PARODI, forwarded by Mr. W. B. Cranwell.

Specimen of Oil of Limes from Trinidad.
From Messrs. WRIGHT, LAYMAN AND UMNEY.

Specimen of Citroptene obtained from the "Oil of Limes." From Mr. J. O. BRAITHWAITE.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL ON COMMITTEES FOR THE YEAR 1883-84.

	Committees held Once a Month or Oftener.		Committees held Occasionally.		Special Committees.	Total Number of Attendances.
	Finance.	Library, Museum, Laboratory, and House.	Benevolent Fund.	General Purposes.		
Number of Committee Meetings held.	11	10	11	10		
Andrews (*London*)	1	2	*	7	*	10
Atkins (*Salisbury*)	6	6	10	10	21	53
Borland (*Kilmarnock*)	*	*	7	7	*	14
Bottle (*Dover*)	*	9	6	5	8	28
Butt (*London*)	*	10	10	10	15	45
Carteighe (*London*)	8	10	5	10	26	59
Churchill (*Birmingham*)	*	*	3	6	*	9
Gostling (*Diss*)	8	8	*	8	*	24
Greenish (*London*)	*	10	10	4	2	26
Hampson (*London*)	*	5	*	8	3	16
Hills (*London*)	11	10	*	9	10	40
Radley (*Southport*)	*	*	10	10	*	20
Richardson (*Leicester*)	*	4	4	4	0	12
Robbins (*London*)	*	7	8	9	11	35
Savage (*Brighton*)	8	*	*	8	*	16
Schacht (*Clifton*)	9	2	*	10	5	26
Squire (*London*)	3	6	*	4	0	13
Symes (*Liverpool*)	4	*	*	5	5	14
Williams (*London*)	*	3	10	10	3	26
Woolley (*Manchester*)	*	*	4	5	4	13
Young (*Edinburgh*)	*	*	8	9	6	23

* Not appointed on this Committee.

NUMBER OF ATTENDANCES OF MEMBERS OF COUNCIL AT COUNCIL MEETINGS FOR THE YEAR 1883-84.

Andrews, Frederick	8	Gostling, Thomas Preston	7	Savage, William Dawson	11
Atkins, Samuel Ralph	11	Greenish, Thomas	11	Schacht, George Frederick	11
Borland, John	9	Hampson, Robert	11	Squire, Peter Wyatt	6
Bottle, Alexander	10	Hills, Walter	11	Symes, Charles	10
Butt, Edward Northway	11	Radley, William Valentine	11	Williams, John	10
Carteighe, Michael	11	Richardson, John George Fredk.	10	Woolley, George Stephen	8
Churchill, Walter John	9	Robbins, John	11	Young, James Robertson	10

Number of Meetings during the year, 11.

Specimens of the α and β Amylsulphates of Barium and of Cerotate of Lead obtained by the oxidation of paraffin. From Mr. W. H. Ince.

Fine specimens of Crystallized Bismuth, Iodide of Lead and Sesquichloride of Chromium. From Mr. E. B. Vizer.

Specimens of Sodium Hydrate in crystals. From Mr. R. A. Cripps.

Specimen of Phosphoric Acid in fine crystals, and Potassio-ferric Oxalate in crystals. From Mr. P. L. Huskisson.

The Professors had attended and reported satisfactorily of their respective classes.

A draft of the Annual Report had been submitted and agreed to.

The Council went into committee to consider the draft Annual Report.

On resuming, it was adopted and ordered to be printed, and the report of the Committee was also adopted unanimously.

FREEHOLD INVESTMENTS.

The report of this Committee stated that one of the purchases sanctioned last month had gone off, the property having been sold while the purchase was under the consideration of the Council, and recommended that the Committee be entrusted with powers sufficient to conclude a bargain when the property had been approved by the surveyor.

The President having explained the subject, the report and recommendations of the Committee were adopted.

New Premises in Edinburgh.

The President reported that the bargain for the premises at 36, York Place, Edinburgh, had been concluded at a price of £1900; the completion of the sale to take place on the 15th inst. He laid on the table plans of the floors and of the elevation of the house, and stated the alterations which the Committee considered it desirable to make in the premises to fit them for the use of the Society.

The Council went into committee to consider the details of this matter.

On resuming it was resolved that the alterations and improvements recommended by the Committee be carried out under the supervision of the local members of the Committee.

GENERAL PURPOSES.

The report of this Committee included the usual letter from the Solicitor stating the progress of cases which had been placed in his hands.

Franklin Goforth, 33, Bridge Street, Runcorn, had paid the amount of penalty and costs into Court.

W. E. Taylor, 3, Victoria Buildings, Burgess Hill, had paid the amount of penalty and costs into Court.

Several cases of alleged infringement of the Act had been considered by the Committee, and recommendations were made in respect thereof.

The report was as usual considered in committee. On resuming, the report and recommendations of the Committee were adopted unanimously.

Application for Remission of a Penalty.

The following communication was read:—

"Treasury Chambers,
"5 *May*, 1884.

"The Registrar of the Pharmaceutical Society,

"Sir,— I am directed by the Lords Commissioners of Her Majesty's Treasury to forward to you two letters in original of the 23rd and 30th ulto. relative to a penalty mposed on Mr. E. A. Browne for an offence apparently against the Pharmacy Act; and I am to request you to submit them to the Council of the Pharmaceutical Society, and to inform my Lords, in order that they may answer Mr. Browne, whether, in the opinion of the Council there is any reason for remitting the penalty or any part of it.

"My Lords have before them the letter (17602) from the Treasury to the Registrar of your Society of 21st February, 1877,* and they have no intention by this present reference of withdrawing any part of it.

"I have the honour to be, Sir,
"Your obedient servant,
(Signed) "R. E. Welby."

After having fully considered the circumstances of the case referred, it was resolved that a reply should be addressed to the Treasury, stating that in the opinion of the Council there is no reason for remitting the penalty or any part of it.

The President said that the person referred to in the Treasury letter had also sent an application to the same effect to the Council, to which he recommended that a similar answer be returned.

This was agreed to.

Report of Examinations.

April, 1884.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major (17th)	8	5	3
,, (23rd)	7	6	1
	— 15	—11	— 4
Minor (16th)	21	6	15
,, (17th)	27	9	18
,, (18th)	26	11	15
,, (23rd)	22	7	15
,, (24th)	25	9	16
,, (25th)	25	10	15
	—146	—52	—94
Modified (16th)	1	1	0
	162	64	98

SCOTLAND.

	Candidates. Examined.	Passed.	Failed.
Minor (9th)	16	7	9
,, (10th)	14	5	9
	—30	—12	—18

PRELIMINARY EXAMINATION.

	Candidates. Examined.	Passed.	Failed.
April 8th.	375	175	200

Nine certificates received in lieu of the Society's Preliminary examination.

1 College of Preceptors.
1 University of Aberdeen.
3 ,, ,, Cambridge.
1 ,, ,, London.
3 ,, ,, Oxford.

Resignation of an Examiner.

The President read a letter from Mr. H. B. Brady, resigning his position on the Board of Examiners, and moved—

"That this Council desires to place on record its high appreciation of the services rendered to the Society by Mr. H. B. Brady, F.R.S., during the twelve years he has been a member of the Board of Examiners for England and Wales."

The motion was seconded by the Vice-President and carried unanimously.

The Botanic Gardens.

A letter was read from the Secretary to the Royal Botanic Society stating that the usual facilities would be afforded for students visiting the Gardens of the Society in Regent's Park, on the conditions hitherto observed.

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* *Pharmaceutical Journal*, [3], vol. vii., p. 737.

NORTH BRITISH BRANCH.

Annual Meeting.

The Annual Meeting of the North British Branch was held in the Society's Rooms, Edinburgh, on Tuesday, April 29, at 4 o'clock afternoon.

Mr. John Nesbit, President of the Branch, took the chair and called upon the Secretary to the Branch to read the

Annual Report.

The Council of the North British Branch of the Pharmaceutical Society of Great Britain have pleasure in submitting their Report for the past year.

The operations of the Branch continue to be carried on with success in all departments. Owing to the early expiry of the lease of the present premises, the question of increased accommodation has again recurred. The limited accommodation of the present rooms has long interfered with the work of the Society, the attendant inconvenience being particularly felt on examination days. It has therefore been determined by the Council of the Society to purchase a house better adapted to the existing requirements and capable of extension should the Branch extend in usefulness and influence. Your Council feel that the accommodation afforded by the house, No. 36, York Place, the purchase of which has been effected, will not only serve the required purposes, but that it will give the Society a position superior to that which it has hitherto held in Scotland. With the change which will occur before the next Annual Meeting, your Council look forward to increased zeal on the part of Scotch adherents of the Society, and augmentation from those who have not yet availed themselves of the advantages offered by it.

During the past year the Library and Museum have been greatly enriched by valuable donations. To the Library several valuable works of reference and scientific periodicals have been added by purchase, and the donations to the Museum have been more than sufficient to fill up the available space.

Many students from all parts of the country continue to take advantage of these departments. To visitors fully three hundred volumes have been lent out from the Library, and for reference it has even more largely than usual been used by those connected with the Society. The number of visitors to the Museum during the past year has been 1514, namely, 980 during the day and 534 in the evening. It is hoped that in the new premises the Library and Museum will always be available for study, as these departments at present are in London.

The Secretary to the Branch reports that a larger number than hitherto of tickets for courses of lectures in botany and chemistry have been issued to pharmaceutical students, and it is pleasing to note that one of them is the Silver Medallist in one of the courses of chemistry lectures, while the names of several others occur in the honours list. Provincial as well as local students now come forward to these classes, and it is noteworthy that there is a growing desire on the part of young pharmacists to undergo a course of instruction in practical chemistry. Many from all parts of the country now spend a short time here in such preparation under recognized teachers. Your Council feel that these circumstances are a strong indication that our young men appreciate the advantage of a systematic course of study, and if they voluntarily undergo a modified curriculum, it is hoped that a well arranged and compulsory one will act more as a stimulus than as a retardation to their progress.

During the winter five evening meetings have been held and a sixth was arranged for April, but owing to examinations and other causes it was not proceeded with. The papers which have been read have in all but two cases come from members of our own profession, and have been marked by their practical importance and general interest. Your Council desire to record their indebtedness to those who have communicated the results of their labours at these meetings. Interesting discourses on subjects allied to pharmacy have also been delivered by Dr. Macadam and Mr. Geddes, and to these gentlemen your Council desire to express their thanks.

In the course of the year the Board of Examiners for Scotland have had four meetings for examination, extending over twelve days. The total number of candidates examined was 146, a large increase over the preceding year. This increase was in Minor candidates, of whom 134 were examined, 59 being successful and 75 being rejected, showing failures to the extent of 56 per cent. nearly,—a rate which, your Council cannot but admit, is distressingly high. Eleven Major candidates were examined, of whom 5 were successful, and also one Modified candidate. For the Preliminary examination 245 candidates have presented themselves at the various centres in Scotland, and the results of the examinations show that 138 have passed. The failures thus number 43·6 per cent., a slight increase over the previous year, but yet under the percentage (49·96) for Great Britain.

Your Council look forward with interest to the effect of the recent change in this examination. Candidates are now allowed one and a half hour for each subject, the object of this extension of time being to allow justice to be done to each portion of the paper.

Your Council regret that the Pharmacy Acts Amendment Bill, which the Council of the Society submitted to the Lords of the Privy Council at their invitation, was not brought into Parliament last session, owing to the slow progress of business in the House of Commons. The prospects of the introduction of the Bill during this session have not brightened; indeed the Lords of the Privy Council have intimated to the President of the Society that it is the intention of the Government to introduce a Bill dealing with the whole question of the regulation of the sale of poisons, but that the Bill will not affect the constitution of the Pharmaceutical Society. Your Council feel that the position of pharmacists cannot fail to be affected by any legislation dealing with the regulation of their calling, and they look forward to the introduction of the Bill with a jealous regard for the interests of pharmacy

In connection with the revision of the British Pharmacopœia, your Council received a communication from the British Medical Council similar in terms to that addressed to the Council of the Society. The communication was referred to a small committee which has not felt it expedient to proceed in the matter pending the action of the Council of the Society to obtain statutory pharmaceutical representation on the Committee for the compilation or revision of the national Pharmacopœia.

In the Report of the Committee of Scrutineers on the voting for the fourteen vacancies occurring in the Council at this time, it will be observed that there is a satisfactory increase in the number of voting papers sent out to the members and associates in business in Scotland, namely, 272, as compared with 247 last year. This gives a fair indication of the steady progress which the Society has been making in Scotland during the past few years: thus, at the end of 1880, the number of adherents was somewhat over 300, while at the end of 1883, they had increased to 409, and it is gratifying to note that a goodly number have been elected this year. With the increased inducements now offered, your Council feel that greater prosperity is yet attainable, and they trust to the support of all Scotch adherents in advancing the interests and furthering the objects of the Society.

Mr. Maben (Hawick), in moving the adoption of the report, said that he considered it as satisfactory a one as had been submitted by the Council of the Branch. The leading feature was undoubtedly that which referred to the acquirement of new premises in Edinburgh. The step which the Council of the Society had taken in this matter was one of the utmost importance to the Branch,

and would be advantageous to the Society at large. He had always felt that in Edinburgh, a city of academies and the most important centre of medical education, the Society should occupy a prominent position. Independent of mere position, it would not be forgotten that increased accommodation implied increased facilities for business and for study, and attraction as a house of call for country members. He hoped that the opening of the new premises would be marked by some distinctive feature, in the way of demonstration and increase of Scotch membership. He was glad to learn from the report that the Society was making progress in Scotland; the additions might be few, no doubt, but that was because the number engaged in pharmacy in Scotland formed a comparatively small proportion of those on the Register, and they had nothing to be ashamed of in the progress which was going on. The results of the examinations were a part of the report which would interest everyone, particularly that which referred to the Preliminary. A change was recently made in this examination which was understood to be in the interest of the candidates, namely, increasing the time given for answering the questions, and so dividing the work as to allow a specific subject for a given time. That, he felt, to be an admirable change. But when one looked at the papers which had been given since the innovation it would be seen that not only was the time increased, but that the amount of work also was increased in at least a corresponding proportion, and, further, that the nature of the work was increased in difficulty. This, he considered, most unsatisfactory, and the result was seen in an increase of failures over last year. He was expressing the feelings of many country pharmacists in saying that this was a matter which required looking into. In commenting on the Pharmacy Acts Amendment Bill, he expressed the hope that it would be enacted ere long, and that the responsibility of prosecutions in cases of infringement would be transferred from the Society to the public prosecutors.

Mr. Tocher (Helensburgh) seconded the motion.

Mr. Borland said that there was one point which Mr. Maben had adverted to in his remarks on the Preliminary examination, in which he was at one with him, and which he properly referred to as a greater degree of severity. Probably the increase was apparent in the examination as a whole, but he thought that it was chiefly evident in the passages for translation from English into Latin. These passages were, he thought, a complete departure from what was intended when they were introduced. It was intended that they should bring out the candidate's knowledge of grammatical construction, but as now given they demanded a verbological knowledge which should not be expected of them. He felt very strongly in this matter, and was glad that the subject had been referred to.

The discussion on this subject was continued by Messrs. Frazer, Gilmour, Kinninmont, McAdam, McLaren, Stephenson and Young, a general opinion in favour of Messrs. Borland and Maben's remarks being expressed.

Mr. Murdoch (Falkirk) wished to draw attention to a subject which was of some importance to those connected with the Society, namely, the increase of open drug shops owned by unqualified persons. It was a well-known fact, he remarked, that the number of pharmacies was increasing out of the usual proportion to the population, and, naturally, registered chemists and druggists were anxious to keep the trade to themselves. But unqualified persons continued to open "apothecaries'" and "medical halls," "laboratories" and the like, with a friendly medical man to come between them and the law when necessary. This was unfair to young men who took the trouble to pass examinations, it was unfair to every registered chemist and druggist, and was very injurious to the public. He would like to see the Society doing something to put down this sort of thing, for as long as it continued it was a slur upon them.

The President of the Branch said that this was a matter which they all regretted, but was one of enormous difficulty to deal with. It should not be forgotten that a medical man was quite within his legal rights in keeping an open shop, and the Society could not, under the present Acts, prevent a medical man or any other qualified person giving the use of his name to an unqualified one. It was the former who was responsible in law, and if he chose to assume the responsibility they might have their own opinions about his conscientiousness, but the existing legal powers could not touch him.

Mr. Borland stated that this was a matter which had engaged the attention of the Council of the Society for a considerable time and he could assure Mr. Murdoch that they were extremely desirous of effecting a change. It might be remembered that the Pharmacy Acts Amendment Bill contained a clause which actually touched these cases. By this clause the Registrar had power to demand the name of the owner of each open drug shop in Great Britain, and it was hoped that this would go a great way to put down illegitimate trading. Unfortunately the progress of the Bill was uncertain, but members could help it on by influencing their parliamentary representatives. If members could suggest any other remedy than the one proposed he could assure them that it would be most carefully considered. Meanwhile they could rest assured that their interests were being constantly attended to by their Council.

Mr. Mackenzie said that there was only one way of putting down this matter, namely, to get a clause inserted in the Medical Acts Amendment Bill to the effect that medical men who kept open drug shops should be qualified according to the Pharmacy Acts. He had every reason to believe that such a clause would be supported by several prominent members of Parliament, and it was well known that leading medical men were in favour of it.

After some further remarks on this subject the report was unanimously adopted.

The Secretary to the Branch then submitted the report of the Committee of Scrutineers on the voting for vacancies in the Council of the Branch, caused by the retirement of fourteen members according to the rule instituted last year. Nineteen gentlemen had accepted nomination for the vacancies. The Committee reported as follows:—

Voting papers issued	272
Voting papers returned	135

Of which *one* was informal.

Leaving 134 papers to be recorded.

After tabulating the votes (a statement of which was laid on the table), it was found that the following gentlemen had a majority of votes:—

Ainslie, William, 58, George Street, Edinburgh.
Borland, John, 7, King Street, Kilmarnock.
Clark, W. Inglis, 26, South Canongate, Edinburgh.
Frazer, Daniel, 113. Buchanan Street, Glasgow.
Laird, George Hardie, 40, Queensferry Street, Edinburgh.
McAdam, Robert, 34, Virginia Street, Glasgow.
Mackenzie, James, 45, Forrest Road, Edinburgh.
Napier, Alexander, 69, South Clerk Street, Edinburgh.
Nesbit, John, 162, High Street, Portobello.
Pinkerton, William. 17, Greenside Place, Edinburgh.
Storie, Robert, 94, High Street, Dalkeith.
Strachan, Alexander, 148, Richmond Street, Aberdeen.
Watt, James, Haddington.
Young, James Robertson, 17, North Bridge, Edinburgh.

The President of the Branch declared that these gentlemen and Messrs. Baildon, Gilmour, Kinninmont, Mackay, MacRitchie, Stephenson, and Storrar (who retain office for another year) would constitute the Council for 1884–85.

Votes of thanks were then awarded to the President, Vice-President, Honorary Treasurer, and Auditors, for their services, after which the meeting adjourned.

As in former years, the new Council met after the Annual Meeting for the election of office-bearers. Mr. Gilmour in proposing the re-election of Mr. John Nesbit, as President of the Branch, took occasion to compliment him on the satisfactory manner in which he had conducted affairs. It was important, he remarked, that a man of experience should occupy the chair during the ensuing year, which would be an auspicious one in the history of the Branch, and he was sure that in Mr. Nesbit they had such an one. He had great pleasure in moving his re-appointment.

Mr. Frazer seconded the motion, and it was unanimously adopted.

Mr. Nesbit accepted office and returned thanks.

Mr. H. Bellyse Baildon, on the motion of Mr. Borland, seconded by Mr. Young, was re-appointed Vice-President, and Messrs. Gilmour and Young agreed to audit the accounts.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 1. Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificates were read for the first time:—H. B. Baker, E. G. B. Barlow, W. F. Fremersderff, J. Hargreaves, F. Nettlefold, J. Parr, A. E. Page, T. Stormouth, J. S. C. Wells.

The following papers were read:—*On Benzoylacetic Acid and Some of its Derivatives* (*Part I.*), by W. H. Perkin, Junior.—For various reasons the author determined to carefully examine benzoylacetic ether with special reference to reactions in which the ketone group takes part. He describes first the preparation of phenylpropiolic acid. Five hundred grams of cinnamic acid are suspended in 1–1·5 litres of absolute alcohol and hydrochloric acid is passed until the whole is dissolved. After standing for two to three hours the product is poured into ice and water. The cinnamic ether separates out as an oil, which is dissolved in ether, washed with a dilute solution of sodium carbonate, thoroughly dried, and treated with 440 grams of bromine. After standing for a short time the whole is poured into a large dish, and the ether allowed to evaporate, when phenyldibromopropionic ether separates out as a solid cake of large crystals. These are pressed between filter paper, and decomposed by alcoholic potash. The potassic phenylpropiolate is finally treated with dilute sulphuric acid when the free acid separates out as an oil. After purification it was obtained in crystals the measurements of which are given. The acid was then converted into phenylpropiolic ether, which, when treated with ordinary sulphuric acid slightly diluted with water, forms benzoylacetic ether. Full details of all the reactions are given. The ether is a colourless oil, boiling at 265° to 270° without much decomposition; it gives the same violet coloration with chloride of iron as acetoacetic ether; boiled with dilute sulphuric acid it splits up into acetophenone, alcohol, and carbonic anhydride. The hydrogen atoms in the CH_2 group are replaceable by sodium. The barium, silver, copper, and lead salts were prepared. When pure benzoylacetic ether is treated with dilute aqueous potash, and the resulting product decomposed with dilute sulphuric acid, benzoylacetic acid was obtained which, after purification, crystallized in thin transparent needles, which polarize light, and melt at 103° to 104°. The copper, lead, calcium, barium, and ferric salts were prepared, and two analyses are given of the pure acid. In the next part of the paper the author has prepared compounds in which the hydrogen atoms in the methylene group are substituted by ethyl, etc. Thus ethylbenzoylacetic acid melting at 111° to 115° and ethylbenzoylacetic ether were investigated, the latter substance when treated with moderately dilute potash yields much phenylpropylketone, but with strong potash mostly organic acids are formed. The latter part of the paper gives an account of the preparation of diethylbenzoylacetic acid, allylbenzoylacetic acid, the corresponding ethers, their decomposition products, and an investigation of the action of bromine on allylacetophenone.

Dr. Percy Frankland then read a paper—

On the Composition of Coal and Cannel Gas in Relation to their Illuminating Power.—In this paper the author gives the results of his examination, somewhat in detail, of the gas supplied to some of the more important towns of the United Kingdom. The constituents which have been individually determined are the hydrocarbons absorbed by fuming sulphuric acid, carbonic anhydride, oxygen, nitrogen, hydrogen, carbonic oxide and marsh gas. In all cases the carbon density of the hydrocarbons has been determined, and in many cases also the hydrogen density; the carbon and hydrogen densities together representing the average molecular formula of the hydrocarbons present. Details of the determination of these densities are given. The reputed illuminating power and the ratio of the illuminating power to the proportion of ethylene to which the heavy hydrocarbons are equivalent are also recorded. The predominant hydrocarbon seems to be ethylene, but the quantity of this gas present is quite insufficient to account for the illuminating power of the gas. So that the denser hydrocarbons, though present in comparatively insignificant proportions, have much to do with the actual illuminating power. In comparing these analyses with similar results obtained in 1851 and 1876 it is seen that the carbon density has diminished whilst the quantity of nitrogen has increased.

Dr. Armstrong said that in oil gas much of the illuminating power was due to acetylene, crotonylene, etc., and, probably, in coal-gas the illuminating power was due to hydrocarbons of the acetylene series rather than to benzene. He suggested that the sulphur in coal gas, other than hydrogen sulphide, might be due to the presence of thiophene.

The Secretary then read a paper—

On a New Form of Pyrometer. By T. Carnelley and T. Burton.—The pyrometer, which the authors have used since 1881, consists essentially of a copper coil, which is placed in the muffle, kiln, etc., of which the temperature is to be determined. Through this coil flows a constant current of water. The temperature of the water is taken as it enters the coil and as it flows out; from the difference of these two temperatures and a table the temperature to which the coil has been exposed can be ascertained. A similar instrument has been devised by Boulier (*Bull. Soc. Chim.*, xl., 108). By means of the above instrument temperatures up to 650° C. have been determined to within 25°.

The Secretary then read three papers by E. Divers and Masachika Shimosé, of Tokio—

I. On Selenium Sulphoxide.—The authors summarize their results as follows:—A yellow modification of selenium sulphoxide appears to exist, but has not been obtained pure; when heated it is decomposeed into selenium and sulphur trioxide; sulphur trioxide oxidizes selenium sulphoxide, forming selenium dioxide and sulphur dioxide. Tellurium sulphoxide when decomposed by water gives tellurium and sulphuric acid, and by a secondary reaction sulphurous and tellurous acids are formed. *II. On the Reaction between Hydrogen Chloride and Selenium Sulphoxide.*—This reaction may be represented by the two equations—

(1) $2SeSO_3 + 2HCl = SeSO_3SeCl_2 + H_2SO_3$.

(2) $SeSO_3SeCl_2 + HCl = Se_2Cl_2 + SO_2HOCl$.

Selenium sulphoxychloride. Selenium selenochloride.

Selenium is dissolved in fuming sulphuric acid and hydrochloric acid gas passed into the solution, which slowly deposits drops of a deep red liquid, which is the selenium selenochloride. The mother liquor contains the sul-

phurylhydroxychloride, which has not yet been isolated. *III. On Selenium Selenochloride.*—The properties, physical and chemical, and an analysis of this substance are given.

Dr. W. R. Hodgkinson then read a paper—

On Fluorene, Part II.—During the fractional distillation of fluorene the author noticed the formation of an orange-red substance. It appeared probable that this body might be an oxidation product. Several kilograms of fluorene, m.p. 100°, were slowly distilled, and the fraction between 280° to 295° crystallized from acetic acid and redistilled; the fraction between 285° and 290° was then passed over a mixture of lead oxide and manganese oxide (5 to 1) in a wide iron tube, heated to the temperature of melting tin. A red solid thus distilled over, but the coloured substance could not be separated from the unchanged hydrocarbons by distillation. A partial separation was effected by boiling the substance twenty or thirty times with 50 per cent. acetic acid, which dissolved out the fluorene. The substance thus obtained crystallized from glacial acetic acid in rhombs m.p. 165 to 170, subliming with partial decomposition and forming a dense red vapour. The body was oxidized by a solution of chromic anhydride in glacial acetic acid. Two oxidation products were obtained, one crystallizing in pale yellow needles almost insoluble in cold chloroform, melting at 278°, and the other separating in short red needles, melting at 188°, both having the composition $C_{13}H_8O_2$. The author has not succeeded in isolating the red colouring substance; it appears to decompose on distillation even in a vacuum, and is equally soluble with the hydrocarbons it accompanies in the different solvents.

The Society then adjourned to May 15.

SOCIETY OF ARTS.

Some New Optical Instruments.

In the continuation of the Cantor lectures upon "Some New Optical Instruments and Arrangements," on Monday, the 5th inst., Mr. Norman Lockyer referred to the refraction and reflection of telescopes. Mr. Thomas Hooke, of York, had increased the aperture from 16 to 25 inches, but the anxiety resulting from introducing this plan led to his death; each lens which he made was tested at his observatory by means of the stars, but afterwards he found that a horizontal well 500 feet long answered the same purpose. The great drawback then to the use of such large apertures was the fact that crown glass of thirty inches diameter could not be obtained. The lecturer drew attention to a telescope of 3 feet aperture combining a minimum of atmospheric current with great freedom and easiness of motion; the polar axis is floated in mercury, and the tube, the rigidity of which is obtained by cross pieces, consists of four T pieces. A telescope of 8 feet aperture with all necessary fittings can be produced in ten months for the sum of £10,000, quite equal to the French 30 feet telescopes, the movable domes belonging to which cost alone £25,000 each. Though the glassworks of the present time are not able to run more than one ton of glass at one time, nearly two tons of porcelain can be reduced to the same state; experiments therefore are being made in Paris for the purpose of solving the question as to the use of porcelain with a glass surface instead of solid glass. The principal improved optical methods relate to the means by which permanent records of the solar spectrum of the stars can be obtained, and also the photographing of the sun, nebulæ and clusters of stars. The greatest difficulties met with are the excess of light in photographing the sun and the feebleness of the rays of light from the stars. Dr. Gadsen has overcome the excess of sunlight by inventing a trap by which a ray is only momentarily allowed to pass through a small slit upon the plate. Photographs taken by this method give a definite view of the sun spots and cyclonic lines on the sun's surface. Dr. Huggins, by focusing the light from a single star upon the plate through the slit for a period of an hour, has obtained photographs of single stars; for this purpose there is no necessity to keep the ray in the exact position the whole time, but should the photograph of a group of stars or nebulæ be required it is obligatory that each star be kept in a fixed position. Mr. Common has devised a method in which a fine platinum wire is kept in the position of bisecting one of the stars by the observer by means of rectangular screws, thus ensuring the fixedness of the other stars. The lecturer showed some photographs of the nebulæ of Orion exposed for periods successively of one, two and a half, four, ten, twenty and sixty minutes, thus as Mr. Lockyer stated, making it possible to learn more concerning the nebulæ of Orion in sixty minutes with nature than in two and a half centuries of human art. So delicate is this method that not only stars invisible to the naked eye are photographed, but with an aperture of thirty inches, stars ·152 of a second distant apart can be separately distinguished. In concluding the lecture, Mr. Norman Lockyer expressed an opinion that the Society of Arts should endeavour to take steps to enable glass lenses and mirrors to be obtained of sufficient diameter and thickness to meet the present requirements of the optician.

A vote of thanks was passed to Mr. Norman Lockyer for the lectures, and also to Mr. Common for allowing his photographs to be exhibited.

Parliamentary and Law Proceedings.

Poisoning by a Liniment.

An inquest was held in the Park Hotel, Birkdale, on Tuesday, April 29, before Mr. Samuel Brighouse, district coroner, on the body of Mrs. Large, who died on the previous Saturday, consequent upon taking a quantity of poisonous medicine.

Winnifred Mabel Large, aged between twelve and thirteen years, daughter of the deceased, said that on Friday Dr. Newsham saw her mother, on which day two bottles of medicine in question were brought to the house by her father. Witness did not think she gave her mother on Friday any of the medicine intended for internal use, but on Saturday morning she gave her a dose of it. About noon the same day she went to give the deceased another dose. The two bottles—one containing the medicine for inward and the other for outward application—were on the dressing-room table in her mother's bedroom, and her mother was in bed. The deceased asked witness to give her a dose of the medicine. The bottles were with their flat side towards the witness at the time, and the word "Poison" was plainly visible on the one containing the liniment. Witness took up the right bottle, but then stooped down to pick up something, and when she rose she lifted the bottle containing the liniment by mistake, and gave her mother a dose from it. As soon as her mother had taken the dose she found that a mistake had been made, and said so. Witness then ran downstairs for a neighbour, and Drs. Vernon and Newsham were sent for. Witness had no idea what deceived her, or caused her to make the mistake, when she rose from stooping for something as described. The room was partially dark at the time, the blind in front of the bed being down.

To the Foreman: I knew the difference between the two bottles. I had been told that the one marked "Poison" contained medicine which was poisonous.

To the Coroner: I can read. It was a tablespoonful of the wrong medicine I gave my mother, the prescribed dose of the other being that quantity.

Dr. Newsham deposed: I practise as a physician and surgeon in Birkdale. On Friday I was called in to attend the deceased and found her suffering from neuralgia. I prescribed medicines for her, one of which was to be

taken internally, and the other to be applied externally. The bottles produced are those I sent. The poison in the liniment is belladonna, and the bottle containing that medicine is marked "Poison" on both sides.

In reply to a question by the Coroner, the witness said that he informed both Mr. and Mrs. Large of the highly poisonous nature of the liniment.

The Coroner remarked that he noticed the bottle containing the liniment and that in which the medicine for internal use was were similar in shape and size. Would it not have been better to put the liniment in a bottle of another and distinctive kind, so that the shape and appearance, in addition to the label "Poison," would indicate its contents?

The witness said he thought not. His experience was that there was less risk of mistake when the two bottles were alike in appearance, because in that case the label bearing the word "Poison" would always have to be referred to. When the bottles containing the two kinds of medicine were dissimilar in shape and appearance he thought there was more liability to error, as the mind became familiarized with them, and sometimes confounded them, there not being the same apparent necessity to look for the label bearing the word "Poison." In such cases as that in question he always supplied the liniment and other medicine in bottles of the same kind. He knew that as a rule medical practitioners when giving two such kinds of medicine put them respectively in bottles dissimilar in shape, but others did not do so. The liniment bottle in question was a four-ounce one, and for each ounce in it there was a drachm of the extract of belladonna root. There was also half an ounce of chloroform in the preparation. A teaspoonful of belladonna of the same strength had been known to prove a fatal dose even when medical aid was at hand. He was of opinion that the tablespoonful administered to the deceased comprised five teaspoonfuls. When he arrived at the deceased's house after the occurrence in question he knew the case was a hopeless one. He had been in practice for ten years as a qualified medical man. In reference to a remark by the Coroner about putting medicines in such cases as that under consideration in bottles of different shapes, witness was of opinion that in giving the bottle containing a poisonous preparation a characteristic shape the mind was taken away from the poison itself. Besides, it was his custom, particularly with regard to the humbler classes, always to warn them to put the poisonous preparation in such a place as would require a distinct act to get at it—on the top of the wardrobe, on the floor, or some such place.

The Coroner: Is there any medicine you prescribe to take inwardly which would poison the patient if a larger dose than that directed were taken?

Dr. Newsham: There is.

The Coroner: Are such medicines labelled "Poison?"

Dr. Newsham: No; but there are directions on the bottle specifying the dose, and how the medicine is to be taken.

After some further evidence the Jury found that the deceased "came to her death by misadventure;" and recommended "that in future the medical profession distinguish poison from medicine for internal use by putting up the poison in a bottle of a different shape from the medicine bottle."—*Southport Visitor*.

Poisoning by Carbolic Acid.

An inquest has been held at the Manchester City Coroner's Court, before Mr. Sydney Smelt, deputy-coroner, into the circumstances causing the death of Samuel A. Janney, an American planter, aged fifty.

From the evidence of Anthony Nava, the keeper of the Crown Hotel, Great Ducie Street, Strangeways, it appeared that the deceased gentleman was a native of Baltimore, United States, and had been staying at the hotel for about two months. He had been ill for about three weeks, and was attended by Dr. Crean and Dr. Dreschfeld, together with a nurse from the infirmary, named Rossington, in the daytime, and a nurse named Mrs. Holliday at night. On Tuesday afternoon the night nurse relieved Rossington, and about midnight Mrs. Holliday came and told him that deceased was much worse, and he went for Dr. Crean. Witness returned, and found both nurses there saying something about a draught, and they showed him a little bottle which smelt strongly of carbolic acid, and Mrs. Holliday said she had given deceased the draught. There were four bottles of carbolic acid in the bar holding about a pint each. The bottle produced held about two tablespoonfuls. All the medicine used by deceased was kept in his room. The nurse was quite sober. Medicine coming into the house was generally placed at the bar window and sent to the room afterwards.

Susan Rossington, one of the nurses to the deceased, said that she used carbolic as a disinfectant. She left deceased with Mrs. Holliday about half-past three and returned about 11 o'clock, when deceased was sleeping. About half-past 11 Holliday asked if she might give deceased a draught which had just come. Witness replied. "Yes, certainly." About 12 o'clock she was aroused again by Holliday, and on going to deceased's room she found he was dying. The small bottle produced, labelled "to be taken immediately," was on the table, and it smelt of carbolic acid. Deceased died about two o'clock. Witness believed that a draught was given to deceased about a week ago from a bottle very much like the one produced.

Mr. Richard Crean said deceased had suffered from liver disease and jaundice. He prescribed a draught for deceased about ten days ago, but had prescribed nothing since then. Deceased was unconscious when he arrived, and died a minute or two afterwards. His lips and tongue were blotched by some corrosive like carbolic acid, and his breath smelt of carbolic acid.

Mrs. Nava, the landlady, and Elizabeth Ann Beveridge deposed to finding the small bottle in the bar the previous night about 10 o'clock. It was standing amongst other bottles, and was not wrapped up and sealed. Such a bottle had never been used for keeping carbolic acid, and they had kept none recently except to disinfect the deceased's room.

Mrs. Holliday also gave evidence, and Thos. Bateson, the assistant to Mr. Thomas Jackson, chemist, of Great Ducie Street, said that the bottle produced was dispensed by him before the 17th of April, and sent to the Crown Hotel, wrapped in paper and sealed. It contained nothing but bromide of potash and camphor water, and it would be sent away full. That dose had been repeated once, but not this week. No draught was sent on Monday or Tuesday.

The inquiry was then adjourned for the purpose of finding, if possible, who put the carbolic acid in the medicine bottle, but without success, and medical evidence having been given that death had been caused by poisoning by carbolic acid, the Jury returned a verdict to that effect, adding that whether the cause was accidental or otherwise, the evidence was insufficient to show.—*Manchester Courier*.

Obituary.

Notice has been received of the death of the following:—

On the 18th of April, Mr. John Pumphrey, Chemist and Druggist, Bengeworth. Aged 64 years.

On the 26th of April, Mr. Richard Burgess, Chemist and Druggist, Winsford. Aged 58 years.

On the 26th of April, Mr. Richard Brierley, Pharmaceutical Chemist, Market Place, Stalybridge. Mr. Brierley had been a Member of the Pharmaceutical Society since 1853, and for several years filled the office of Local Secretary.

On the 30th of April, Mr. Thomas Bell, Chemist and Druggist, Ambleside. Aged 68 years.

Review.

THE GOLD-HEADED CANE. Edited by WILLIAM MUNK, M.D., F.S.A., Fellow and late Senior Censor of the Royal College of Physicians.*

A conventional dress and manner characterized the physician of a former century; the wig as part of a professional costume came in with Charles II., and continued to be worn long after George III. was king. The cane proper, which was indispensable to a medical practice, had a rounded knob or head, often of gold, sometimes of silver, but in later times generally of ivory. In earlier times the knob was perforated and contained Marseilles vinegar.

The celebrated Dr. Radcliffe, who gave his name to the Infirmary at Oxford, had a cane made of a particular pattern for himself, the shape being what is now called a crutch. This gold-headed cane was inseparable from the doctor, who for many years was President of the Royal College of Physicians; and on his death the symbol of authority passed successively into the hands of Mead, Askew, Pitcairn and Baillie, all foremost physicians of their day.

Dr. Macmichael, the intimate friend of Sir Henry Halford, took an extreme and personal interest in the College of Physicians, of which he was for five years registrar; and he hit upon the idea of making the gold-headed cane relate the history of the medical events which it may have been supposed to witness. Hence the book and the anecdotal sketches of the five celebrities just mentioned.

Dr. Munk brings the record down to more modern date, and contributes notices of Halford, Paris and Mayo; together with a running commentary on things medical; men, however, rather than medicine being described.

It is pleasant to read about Dr. Radcliffe, with his strong common sense and knowledge of the world which stood him in such stead; how he dared against opposition to treat small-pox with fresh air and cooling emulsions; how before the end of his first year in London he gained twenty guineas a day by regular practice, exclusive of fees that would appear fabulous were they not historical; and how Dandridge, the apothecary whom he patronized, died worth more than £50,000. But we have always admired most the story of the conversation said to have taken place between himself and his classical successor, Mead. "What," said Radcliffe, "you read Hippocrates in the original? Take my word for it, when I am dead you will occupy the throne of physic in this great town." Mead:—"No, sir; when you are gone, your empire, like Alexander's, will be divided amongst many successors."

Mead was an accomplished and varied scholar: he studied the nature of the plague which had made such serious havoc; strongly recommended inoculation in case of small-pox at the instigation of Lady Mary Wortley Montagu; altered the treatment of dropsy by bandaging after tapping; and attended the last illness of Sir Isaac Newton. Two most interesting digressions occur in the biography of Mead, the history of the College of Physicians, and that of the Royal Society.

Passing over the three next worthies we come to Dr. Munk's own share in the recital.

Few have more adorned their profession, or have been more continuously successful than Sir Henry Halford, Bart. His family name was Vaughan, but on the receipt of an ample fortune this was changed to Halford according to the terms of the bequest.

His father, Dr. James Vaughan, himself an eminent physician at Leicester, had five sons; he devoted the whole of his annual professional income to their education, and all five in turn became distinguished, and, indeed, remarkable in their several callings. All five rose to independence as soon as their education was completed.

When Halford (he is known now only by this name) came to London to practise medicine he borrowed a thousand pounds and started with that capital; he married a nobleman's daughter, having two years before been appointed Physician Extraordinary to the King (George III.). In seven years he had to resign his position at the Middlesex Hospital owing to the claims of private work; and then his reputation caused him to be consulted by Georgiana, the beautiful Duchess of Devonshire. Her disease was beyond all medical aid, but Halford was proved to have been correct in his diagnosis, contrary to the opinion of the regular physicians of her grace. His professional income rose instantly and largely. During his first year he had realized 200 guineas; in his sixth year the amount was 1000 guineas. Five years exactly after this event he and Dr. Baillie, the other fashionable physician of the day, were posting down to Windsor to visit Royalty. They compared their annual incomes; Halford had made 9500 guineas; Baillie, 100 guineas more. Sir Henry Halford was Physician in Ordinary to four successive sovereigns; almost every member of the Royal family, from the time of George III. to the death of George IV., had been under his professional care. His patients were the Court Guide. He was noted also for his admirable Latinity, his compositions in that language being a study worthy of imitation. By his chief instrumentality, and while he was president, the College of Physicians was removed to its present situation in Pall Mall; and Halford established there a series of evening meetings, which were frequented by the leading representatives of learning, literature, and science.

The author of the 'Pharmacologia,' John Ayrton Paris, has reaped more than passing fame from his fine contributions to medical literature. Strangely enough, his name is subject to a typographical error in the 'Gold-Headed Cane.' Exception may also be taken to the disquisition on solar, telluric and animal heat introduced into this section; it appears to be inserted in the wrong place, and the illustrations are not new.

Dr. Paris succeeded Sir Henry Halford in the Presidential chair of the College of Physicians. His career is specially interesting to the pharmacist from his attachment to chemistry and materia medica; in fact, a predilection for natural science characterized his whole life. Through his influence the Royal Geological Society of Cornwall was established. The safety bar and an instrument called the shifting carriage were said to have promoted the security of the miner as much as the Davy lamp. It was Paris who took an interest in young Faraday and secured for him the credit of having first liquefied chlorine gas. He soon became the most popular lecturer on materia medica in London, and his class was attended by many distinguished physicians of the next generation. In his own department he has had no superior in clearness and power of exposition. His best known work, mentioned already, ran through many editions and realized for its author above £5000. For the 'Treatise on Diet and Regimen,' he received £1000 before a line of it was written; and a similar sum for his 'Life of Sir Humphrey Davy,' when it was finished. Two works came to grief, 'The Medical Jurisprudence,' and 'The Elements of Medical Chemistry.' Here he shared the fate of Sir Benjamin Brodie, whose 'Psychological Studies' were not favourably received. But he made amends by his profits on a little book called 'Philosophy in Sport made Science in Earnest.' Those who would learn how to write the English language can have no better model than the 'Historical Introduction to Materia Medica,' which forms a sort of long preface to the work by which Dr. Paris will be remembered.

Here we must close these notes on Macmichael's 'Gold-Headed Cane' and its continuation by Dr. Munk.

* London: Longmans, Green and Co. 1884. Crown 8vo. Pp. i.-xvi., 1-246. 7*s.* 6*d.*

It is brimful of anecdote, and contains authentic information on the rise and constitution of certain great institutions.

All books of this class deepen our esteem for the acquirements and character of the medical profession; and we may reflect with pleasure, that however distinguished or successful were the physicians of a former date, they have left a race as eminent, to sustain the traditions of the past.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Liquid Extract of Cinchona.

Sir,—In the experiments I made for the purpose of obtaining data on which to found the process I have suggested for liquid extract of cinchona, a sample of succirubra bark was first operated upon which, tested by De Vrij's method with lime and alcohol, yielded 4·8 per cent. of total alkaloids; and this in No. 60 powder, when treated as I have described with hydrochloric acid and water, and reduced to a dry extract, gave by precipitation with soda an amount of alkaloid corresponding to 4·3 per cent. of the bark used. In this operation not only was the percolated liquid acid, but the marc at the end of the process was slightly so also, and viewing this in connection with the fineness of division of the bark and the known action of hydrochloric acid as a solvent of cinchona alkaloids, the result did not exceed what appeared to me reasonable to expect. I took the near approximation of the amount of alkaloids in the extract to that in the bark yielding the extract as indicating a practical exhaustion of the bark, although, no doubt, further evidence would be looked for to establish complete exhaustion, especially as the method I adopted for estimating the alkaloids in the extract is not a rigidly exact one. My object was to devise a method as little complicated as possible and suitable for adoption by pharmacists generally, but the desire to submit such for criticism at a pharmaceutical meeting before the meetings had terminated for the season rendered it necessary to leave several parts of the investigation to be subsequently completed.

Since the publication of my paper I have repeated the process upon further samples of East Indian succirubra bark with results similar to those I have already recorded. The barks I have used have contained from 4·8 to 5·5 per cent. of total alkaloids, and with these I have found that when the percolated liquid has reached a quantity corresponding to ten or, at most, eleven pints of percolate from a pound of the bark, it has ceased to give a precipitate with soda. The marc, on being then treated with fresh hydrochloric acid, although yielding a solution which gives a dark brown extract with soda, some of which may be precipitated, has afforded me no distinct evidence of the presence of alkaloid. By a more searching process, however, with lime and alcohol (De Vrij's method) a small quantity of mixed alkaloids may be extracted, amounting, I have found, to about a tenth part of the alkaloids originally present in the bark, as determined by the same method. Thus a bark containing 5 per cent. of alkaloids, after being exhausted by the hydrochloric acid process, yielded 0·53 per cent. of additional alkaloids, the same method of estimation being adopted in both cases.

The results obtained by Mr. Cownley, and published in last week's Journal, appear to me to be explicable only by assuming that the sample of bark he has operated upon differed very much from any of those I have employed. It was richer in alkaloids than any of mine, but I do not think that alone would account for the results obtained by him. I have not yet worked on barks so rich in alkaloids as the one he describes, but am prepared to find that some modification of the process, especially in regard to the proportion of hydrochloric acid, may be necessary to meet the requirement of very rich barks. I attach importance to the degree of comminution of the bark in treating it by this process, and the fact that Mr. Cownley found it necessary to continue the percolation much further than I have done has raised a doubt as to whether he used the bark in sufficiently fine powder.

T. Redwood.

Spirit of Nitrous Ether.

Sir,—I am sorry to occupy more of your space with a subject which may not be of general interest to your readers, but Messrs. Dott and MacEwan are evidently so extremely irritated at my remarks and appear to have taken such pains to show that they are the only people who know anything about the above subject, and have done this in such a manner, that I feel called upon to reply. Mr. Dott's allusion to what he calls my sneer is calculated to produce an utterly wrong impression. I expressed my disappointment at the papers of these gentlemen because I had expected something very much better from them and from the North British Branch, from which source some of the best and most useful papers which have appeared in the Journal recently have been derived, notably those by Dr. Clarke and Messrs. Gilmour, Aitken and many others. If my expression was taken as depreciatory of the papers which have been contributed—some by Mr. Dott himself—to that Branch, I very much regret it, and I do not think that it was capable of that construction. Mr. Dott seems determined to foist upon me, notwithstanding my denial, an opinion which I neither held nor expressed.

I am content to leave anyone who is interested in the subject to judge whether my words as quoted by Mr. Dott are fairly capable of the construction which he puts upon them.

I am not surprised that Mr. Dott, who no doubt can perfectly account for the respective functions of the various constituents of the sundry acetous preparations so long used, should sneer at the acetic acid having anything to do with their actions; I indeed quite expected as much, and will not further enter into the subject, although Mr. Dott is pleased to call my remarks "sheer nonsense." Mr. Dott in his paper says, "the only mention I have seen of the use of potassium iodide as a means of estimating," etc., etc., and refers to Mr. Hehner's suggestion of using this reagent with acetic acid; but in his recent letters he speaks of the idea as being in no way new, and says that he only refrained from mentioning my process as he could only have done so to condemn it. Which of these statements are we to believe? I had undoubtedly seen Mr. Hehner's remarks, but had forgotten them entirely, or I should probably have tried the acetic acid which he suggested. The idea is of course such a very likely one to occur to anyone that I did not claim any originality for it, which Mr. Dott certainly does, although he only copies Mr. Hehner's idea, simply substituting sulphuric for acetic acid, adding a little spirit, and adjusting his quantities to give whatever may be decomposed in terms of nitrite of ethyl. Mr. Dott ridiculously accuses me of believing and imagining a great deal too much; but I do not, as he does, imagine that an ingredient forming perhaps one fifth of the peculiar principles of the preparation is the only one worth estimating.

In reply to Mr. MacEwan's letter, I must admit that I did write two months for three weeks, but the matter is of no moment.

Mr. MacEwan then proceeds, with a politeness even surpassing that of Mr. Dott, and an assumption of wisdom quite pleasing, to state that I have neglected to take account of a certain elementary chemical fact; but he seems to forget that he admits in his paper the fact to which I alluded, and the only difference between us is one of degree.

He says that "the method is certainly not free from objection, the sources of error being (1) decomposition—

that is, further acidity." If for the words "the method is not free from objection" he had written is "worthless" I should have agreed with him. It is unfortunate for Messrs. Dott and MacEwan, who unite in heaping contempt upon me, that their results, as pointed out by Dr. Clarke, by no means agree.

Mr. Dott's figures are equally at variance with those of Dr. Dupré, who found by his process, which, like Mr. Dott's, includes free nitrous acid (and which, he admits, over estimates), only about half what Mr. Dott has found.

In conclusion, I may say that any reaction peculiar to a substance and which is capable of being measured forms, so far, a means of estimating it, and in this way neutral iodide of potassium does, without any acid, enable the B.P. preparation to be estimated. That this reaction is not only dependent upon the acidity is proved by the fact that spirit of nitrous ether when fresh liberates more iodine than it does after keeping.

When, as Professor Attfield says, we do not know what sp. æther. nit. is, it is surely better to rely upon a reaction which the preparation shows than to theorize and found a test upon your theory. A. C. ABRAHAM.

[*** We would suggest the desirability of avoiding the tone of personality which the correspondents on this subject seem inclined to assume.—ED. PHARM. JOURN.]

THE ANTIPODES.

Sir,—My attention has just been directed to a request by "Inquirens" for information as to the prospects of pharmacists at the Antipodes.

Eight years ago I was in Melbourne, and present at the first annual dinner of the Pharmaceutical Society of Victoria, and had then an opportunity for speaking on some of the subjects referred to in "Inquirens'" letter. I stated, that from what I had observed respecting the arrangements and conduct of colonial pharmacies, I had no hesitation in expressing my opinion that they were generally excellently appointed establishments, and some of them equalled, if not surpassed, many of our leading pharmacies at home. In fact, in the larger cities and townships, notably Melbourne, Ballarat, Sandhurst and Geelong, in Victoria; Adelaide, in South Australia; and Sydney, Bathurst, Newcastle and Maitland, in New South Wales, pharmacies were to be met with that would not be out of place here, in Oxford Street and Regent Street; I told them they followed us so closely that when walking up Bourke Street, or through Collins and Swanston Streets, Melbourne, "doing the block" as they call it, it was difficult to believe, and hard to realize the fact of being over sixteen thousand miles away from London. As the only representative present of the parent Society, and as a Founder of that Society, I was invited to give my impressions of pharmacy in Victoria, and I remarked that whilst I was astonished at the evidences of advanced pharmacy everywhere observable, I feared they were following us almost too closely, as they had evidently got into some of our bad habits, for I observed they kept open their establishments until 10 o'clock p.m. and even later on Saturday nights, which I thought could not be a necessity, but on the contrary was a very great mistake.

From a notice in this same Journal of April 12, under the heading of "Pharmacy in Victoria" I regret to learn the long hours system still continues; but an effort is now being made by the Chemists' Assistants' Association to bring about a slightly improved state of things, and I wish them all success, trusting it may lead to something better still.

In reply to the question "Would it be better to take situations as assistants, or start at once on our own account?"—I have no hesitation in advising the adoption of the first course. Get into some good pharmacy for a year or two; it will not be lost time, you will be getting acclimatized and experienced, and be able to look about you before settling down.

The leading pharmacists there, as here, object to engage assistants who merely seek their own interests, and expect at least a two years' engagement.

Qualified assistants, with good testimonials, run no risk of failing at once to meet with first-class engagements and liberal remuneration for their services; but let there be no mistake, there must be the *quid pro quo*.

The man who would not make his way at home is not the man to emigrate; he will utterly fail in the colonies.

Before settling down to a business on his own account I would recommend "Inquirens" to take a trip to New Zealand, as Dunedin, Christchurch, Wellington and Auckland all present most favourable opportunities as centres for observation and experience, and the climate generally is more adapted to the English constitution.

My impression also is, that there are better chances for commencing business there, than in the larger Australian cities.

5, *Coleman Street, E.C.* G. B. FRANCIS.

HAWKING CHEMISTS AND CUTTING PRICES.

Sir,—I am glad to see a letter in your last issue on the above subject. To my mind it is sad to find that after all the efforts put forth to elevate the position of chemists in this country we find it a fact in the year 1884 that some members of our trade or profession (?) should stoop to such mean practices as to hawk their goods about, and also to solicit orders from door to door, and that sometimes in a most offensive manner. I am not quite sure in a case lately reported if the parties are not breaking the law by not taking out a pedlar's licence, too. Cutting shops and their doings have been freely discussed in your Journal, and in this free country I do not see any good remedy has been proposed to stop it. The only chance the future chemist will have is by bringing to bear his higher education and professional ability that he may gain public recognition. I am not qualified by examination, being one of the older members of the trade, but, nevertheless, qualified I hope by long experience. I positively admire and respect the man who modestly holds the Major certificate of the Society; but the man who just struggles through the Minor and then announces to an astonished world that he is a chemist and druggist by examination should be treated as a humbug by all who would see this trade raised to its proper status.

Cutting prices have frequently been brought about by the grasping characters just alluded to; not content with their own business they press hard upon the heels of some 'cute grocer, who, in revenge attacks the legitimate goods of the chemist.

I see no help for it but the powerful influence of the trade through the Society being brought to bear upon such individuals until they are perfectly ashamed of their caravan drug carts and druggists' shops on wheels, etc. When a member of the medical or legal professions bemeans himself he soon loses caste. Why should it not be so with chemists?

A NORTHAMPTONSHIRE CHEMIST.

Herbalist.—(1) *Euonymus europæus.* (2) *Petasites vulgaris.* (3) *Lycopus europæus.* (4) *Tamus communis.* (5) *Solidago Virgaurea.* (6) *Carpinus Betulus.*

F. A. Foot.—(1) *Lychnis.* (2) *Geranium Robertianum.* (3) *Stellaria Holostea.* (4) *Myosotis arvensis.* (5) *Nepeta Glechoma.*

"*Nemo.*"—Apply to the Army Medical Department, Whitehall Yard.

J. H. Dunn.—Digest powdered cochineal in a weak solution of ammonia or sal ammonic and afterwards dilute with water.

J. A. B.—The poison in the preparation has been repeatedly stated to be strychnine, indigo being used as a colouring material.

C. R. Hooper.—Shaving Cream.—Soft soap, ¼ lb.; boiling water, 1 pint; dissolve, cool, and add oils of cinnamon, verbena and neroli, 6 drops, dissolved in rectified spirit, 1 pint; mix well and if not perfectly transparent add a little more strong spirit, or filter through paper.

Inquirer.—*Bi*carbonate, certainly. (2) It has been before pointed out that the ℥ is the characteristic symbol of the "apothecaries'" and not of the "avoidupois" ounce. See the discussion on the subject in *Pharm. Journ.*, [3], viii., 477.

C. D. C.—We are not acquainted with the book to which you refer.

J. Epps, jun.—The specimen is *Myosotis sylvatica.*

COMMUNICATIONS. LETTERS, etc., have been received from Messrs. Rogers, Mason, Parisot, Wilkinson, Elborne, T. S., Anonymous.

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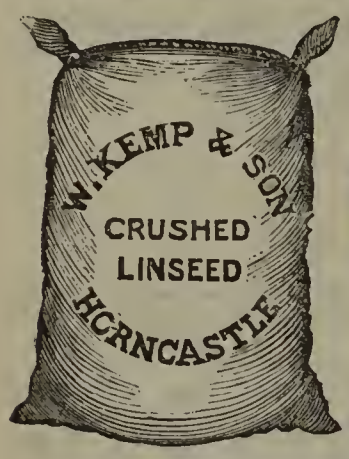

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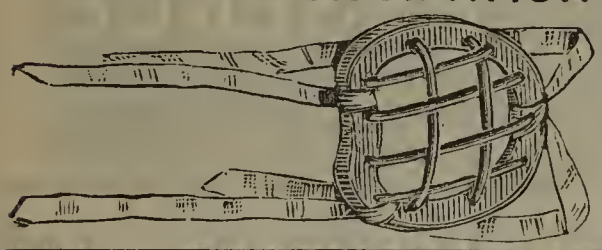

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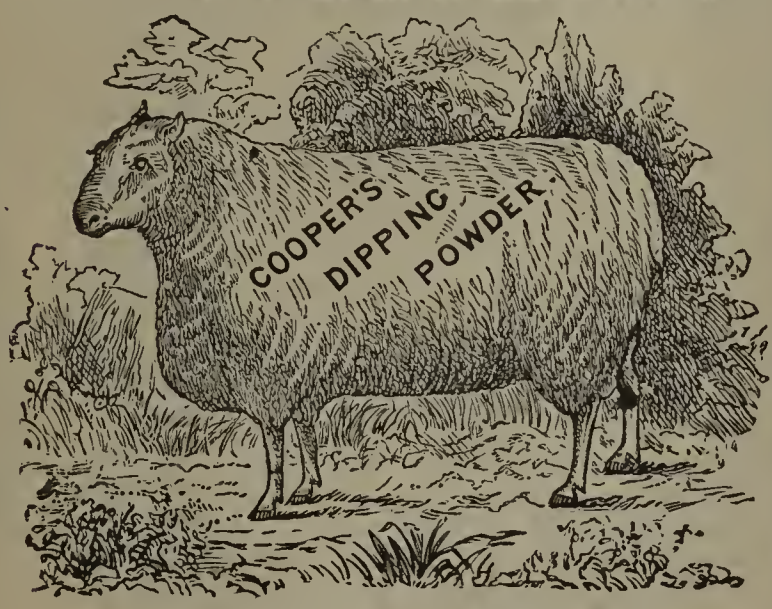

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„	F. O. GOLDING	London.
„	T. GROVES	Bridport.
„	G. E. HARE	Nottingham.
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„	T. JENKINS	Aberdare.
„	T. LEWIS	Llagain.
„	J. F. MARLAR	Halstead.
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„	J. W. TAYLOR	Norwich.
„	A. TENNANT	Lancaster.
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PRELIMINARY.

Mr.	W. S. EDWARDS	London.
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Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing Sept. next.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

ENGAGEMENTS WANTED.

JOHN W. DENNIS, Chemist, Louth, Lincs, wishes to place his son, in his 19th year, in a good house of business as IMPROVER. Has had 2 years' experience.

A CHEMIST is desirous of placing his SON, age 16, as an IMPROVER or to finish his apprenticeship. Has been 16 months in the business. Time for study and comfortable home required. No objection to receive a Chemist's Son on mutual terms. W. H. REES, Chemist and Dispenser to County Infirmary, Haverfordwest, South Wales.

A PHARMACEUTICAL Chemist wishes to place his son (in 17th year), height 5ft. 10½in., with over a year's experience as JUNIOR or IMPROVER, with comfortable home and time for recreation and study. Salary nominal. C. E. R., Grafton House, Esplanade Gardens, Scarborough.

BY a young man aged 22. In London. Where time would be given to study for the Minor. Small salary required. ALPHA, Park House, Shaftesbury.

AS ASSISTANT or JUNIOR, accustomed to Dispensing and Retail. Good reference. Abstainer. Moderate salary. CHEMIST, 64, Hutcheon St., Aberdeen.

AS ASSISTANT, at seaside or in good country business. First-class experience and references. Major qualification. Height 5ft. 6in. JNO. WOOD, High St., Leighton Buzzard.

TEMPORARY. Ætat. 32. A. WOOD, 7, Woodfield Cres., Harrow Rd., W., is open to engagements by day or week. Thoroughly experienced. Irreproachable references. Terms very moderate.

WHOLESALE Drug and Chemical Trade.—Advertiser seeks engagement as WAREHOUSEMAN or TRAVELLER. Had several years' experience in the former, and used to buying. Age 27. B., 4, Garfield Ter., Grange Park Rd., Leyton.

AS JUNIOR to a Chemist, or DISPENSER to a Surgeon. Age 21. 5½ years' experience. Good references. S. E. CLARKE, 9, St., Stephen's Sq., Norwich.

ASSISTANT. Ætat. 22. Height 5ft. 8in. 7 years' good experience. Excellent references. Good Dispenser. CHEMICUS, 43, Victoria Rd., Fulwood, Preston.

AS TEMPORARY. Well up in all branches. Highest references, and moderate terms. Disengaged. M. B., care of Yates & Co., Stationers, Dalston Lane East, Dalston Junction, N.

ASSISTANT in a first-class business where two or more are kept. Age 24. Minor qualification. CHEMICUS, 9, King's Parade, Cambridge.

ENGAGEMENTS WANTED.

MAJOR Student seeks engagement in London for part (or whole) of day. Out-door preferred. First-class references. Personal interview if convenient. T. GROVES, 43, Trinity Sq., London, S.E.

AS ASSISTANT. Age 22. Height 5ft. 9in. 6½ years' experience in first-class Dispensing and Retail. Five kept. Accustomed to take full charge. Highest references. Disengaged. London or suburbs preferred. State particulars. A., 1, Union Sq., Islington.

LOCUM TENENS. Old-established. Temporary assistance for any period, town or country, by WM. COTTLE TAYLOR, 68, St. Stephen's Avenue, Shepherd's Bush. Please copy address.

AS JUNIOR. Age 19½. 4 years' experience. Height 5ft. 7in. Good references. H. ROBERTS, 39, Hanson Lane, Halifax.

A STUDENT desires engagement in London, with time for attending lectures. Good references. Salary no object. In-doors. H. J. E., Messrs. Wills & Wootton, Westminster College, S.E.

AS JUNIOR, age 22, with time to attend lectures. London experience. CHEMIST, D. Anderson, 1, Vine St., Minories, E.C.

EVENING employment as ASSISTANT to Chemist or DISPENSER to Medical Man, wanted by M. P. S. T. S. DYMOND, Bycullah Rd., Enfield, Middlesex.

AS JUNIOR, in a Retail and Dispensing business. Age 22½. 8 years' experience. Now disengaged. London or South Coast preferred. 906, Mr. Harold, Grand Carrefour, Guernsey.

AS ASSISTANT, in London or suburbs. Time for study preferred. 13 years' experience. Passed Preliminary. Please state particulars, and for references J. T., Mr. Williams, Chemist, &c., Taibacle, Glam.

ASSISTANTS WANTED.

TO Dispensers.—For the Prison Service, a COMPOUNDER OF MEDICINES. He must hold a diploma of the Pharmaceutical Society. Age between 24 and 40. Salary £83, rising to £103, with quarters, or allowance in lieu, uniform, and medical attendance and medicines. Personal application, with satisfactory testimonials of recent date from responsible persons, should be made to the Governor of the nearest Prison, or, in the case of candidates residing in or near London, at the Prison Department, Home Office, Whitehall, S.W., between 11 a.m. and 2 p.m. No travelling or other expenses will be allowed. No person whose health, character, and past career will not bear the most rigid investigation need apply.

AN ASSISTANT, about 21, in a light Retail and Dispensing business, as soon as possible. Applicants please enclose references and photograph to Mr. H. BADCOCK, Lymington.

IMMEDIATELY.—An ASSISTANT. One only kept. Time for study. Apply, stating full particulars, to Mr. F. E. FITT, Pharmaceutical Chemist, Barking, near London, Essex.

IMMEDIATELY.—A competent ASSISTANT. In or out-door. Age not under 24. Apply, with carte and full particulars, to J. HILL, 1, Castle St., Reading.

JUNIOR ASSISTANT, at once, accustomed to light Retail and Dispensing business, with good references. Apply, with usual particulars, enclosing carte de visite, stating height, age, when at liberty, to J. C. & A. THRESH, Buxton.

A LABORATORY man, accustomed to steam goods. Apply to JAMES WOOLLEY, SONS & Co., Manchester.

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AT once. — For a good-class suburban business, a competent ASSISTANT. In-door. First-class references required. Apply, stating usual particulars and enclose carte, to STATIM, Messrs. Herrings & Co., 40, Aldersgate St., London.

THE General Apothecaries' Co. require a competent Junior ASSISTANT for their City branch. Personal application to Mr. J. J. PIERCE, 27, Bishopsgate St. Within, E.C.

ACTIVE, obliging ASSISTANT. From 25 to 30 years old preferred. Out of doors. No Sunday duties. Character must bear strict investigation. Apply personally at 143, Hackney Rd., E.

FOR end of May.—A competent ASSISTANT (two and apprentice kept) of good appearance and address, accustomed to the best class of trade. Must be a good Counterman and write a neat hand. Apply, enclosing carte and full particulars, to EDW. PEARSON, Nottingham.

AN ASSISTANT (in-door), about 23 years of age, by the 23rd inst, accustomed to a good Dispensing and Retail business. Apply, stating age, height, and salary required, with references, and carte if convenient, to WILLIAM STAFFORD, Pharm. Chemist, Gloucester.

L. FLEWITT, High St., Birmingham, requires a Junior ASSISTANT. Good personal character and references necessary.

AN ASSISTANT, in-doors, about 21 years of age, to travel two days a week. Apply, stating age, salary, height, with references and carte, to EDWARD VINSON, Middle Row, Maidstone.

AN ASSISTANT, about 21 years of age, accustomed to a country business. State full particulars as to age, salary, experience, with reference, to H. BARTON, Pharmaceutical Chemist, St. Ives, Hunts.

AN ASSISTANT, about 24. Must be a neat and accurate Dispenser. Minor qualification preferred. Apply to VINCENT & SON, Walham Green, S.W.

WHOLESALE.—As Junior CLERK in office. One who has served his time to Retail preferred. Address, stating salary and full particulars, to A., care of C. Birchall, Advertising Agent, Liverpool.

AT once.—An active Junior ASSISTANT, with Minor qualification, of gentlemanly appearance and address, for first-class Dispensing and Retail business. Address, Mr. HALL, West Cliff Pharmacy, Folkestone.

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AS early as possible.—A gentleman, between 30 and 45. Must be thoroughly well up in Prescribing. One having had Hospital practice preferred. In-door or out. Good salary to a suitable person. BELL, CHESSHIRE & Co., Chemists, 378, Coldharbour Lane, Brixton.

A QUALIFIED ASSISTANT, to take the entire Management of a Branch business. A good Dispenser and Prescriber, with first-class references, may apply, stating age, height, and salary required, with full particulars of previous experience, and enclosing photo. (to be returned), to J. H. READ, Chemist, 2, Market Ter., Upper Holloway, N.

A QUALIFIED out-door ASSISTANT, not under 25, to Manage a Branch. Must be single, and well up in Teeth Extracting and Prescribing. Apply, enclosing carte (to be returned), to R. BROOF, Northgates, Leicester.

MR. STOOKE, Chemist and Surgeon-Dentist, will require an ASSISTANT, about 21 years of age, at the end of May, who can Extract Teeth, Prescribe, Dispense and attend to general Retail. Address, King St., Milton-next-Sittingbourne, Kent.

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A JUNIOR ASSISTANT, well up to good class business. About 23. Gentlemanly appearance and address indispensable. C. LOWE, Surbiton, S.W.

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OUT-DOOR.—A Junior ASSISTANT, accustomed to a light Retail and Dispensing business. Please send full particulars, and enclose carte, to Y. F., care of Messrs. Hodgkinson, 198, Upper Whitecross St., E.C.

JUNIOR ASSISTANT, in-doors, for a first-class Surgeon's Retail. Must thoroughly understand the work, and preference given to one who can Prescribe, Extract Teeth, and do Midwifery. Apply personally, or by letter, stating experience and salary required (which must be moderate), to Dr. CHANDLER, 22, Battersea Rise, Clapham Common, S.W.

AT a West-end Pharmacy, a reliable DISPENSER and fair Counterman. Preference given to one requiring a permanent situation. Carte (to be returned), with height, age, experience, references, and salary required, to X. X., Messrs. Herrings & Co., 40, Aldersgate St., E.C.

BY 5th of June.—As second ASSISTANT. Age about 23 Accustomed to superior class of business. Experienced Dispenser. Must write a good hand. Business hours 8 to 8.30. Allowed one evening a week from 5.30 to 11, and another evening from 9 to 11. Whole of every other Sunday. Commencing salary, £40. Must apply (personally), morning 10 to 12, evening 6 to 8. WHITE & SON, 19, Park Ter., Regent's Park.

AN ASSISTANT, about 22 or 24 years of age. Must be a good Dispenser. One from the country preferred. Apply, stating height, salary and references, to Mr. DAMPNEY, 87, Abingdon Rd., Kensington.

AS early as possible.—A competent ASSISTANT. Must be a good Dispenser and obliging Counterman. Two kept. Apply, if possible personally, to C. E. TURNER, 14, Bury St., Bloomsbury.

ASSISTANTS WANTED.

A COMPETENT Assistant, out-door, for the country. Trade chiefly Retail and heavy goods. Salary 30s. weekly and a small commission. State references and reasons for leaving last situation. A pushing young man may find this a permanent situation. State qualifications (if any) and address J. Morton, Ramsbottom, Manchester.

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J. HESSELL, Chemist by examination, 200, Essex Rd., Canonbury, N., requires a gentlemanly youth as Apprentice. One passed Preliminary preferred, not compulsory. Comfortable home and every help given for the Minor. Good opportunity for an energetic young man to thoroughly learn his profession. Moderate premium required.

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J. THOMPSON, Pharmaceutical Chemist, Lodge Lane, Liverpool, has a vacancy for a gentlemanly youth as Apprentice. Either in or out-door.

A QUALIFIED man, competent to undertake the entire Management of a Mixed ready-money business in a low neighbourhood in a large country town. A rare chance for an energetic person well up in Prescribing. References must bear the strictest investigation. Address, giving full particulars as to previous engagements, and terms, to L. E. X., Mr. Ackerman's, 335, Coldharbour Lane, Brixton, S.W.

IMMEDIATELY.—A Junior, able to Prescribe. Ample time for study. Comfortable home. Small salary. C. E. Mitchell, Chemist, 31, Cottenham Rd., Holloway, London, N.

A JUNIOR Assistant, about 20 years of age, for a Dispensing and Family business. In-doors. Senior kept. One who has just finished his apprenticeship in a good house, been accustomed to Dispensing, and passed Preliminary. Full particulars to A. Greenall, 10, South Rd., Waterloo, near Liverpool.

A JUNIOR Assistant, about 21 years of age, of gentlemanly appearance and address, and accustomed to a good country business. Apply, stating experience, age, height and salary required, to A. H., care of Messrs. Hodgkinsons & Co., Upper Whitecross St., London.

SEASIDE.—Immediately.—An Assistant, in-doors, not under 23. One accustomed to a first-class Retail and Dispensing business. One seeking a permanency preferred. Apply, stating age, height, salary required and references, with carte (to be returned), to E. M. Smith, The Medical Hall, 34, St. Thomas St., Weymouth.

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AN old-established Business, in a pleasant village in the Midland Counties. Returning over £600 per annum at good profits. No opposition. Rent £32. Price to be arranged. Address, T. P. A., Wyleys & Co., Coventry. No agents.

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A SECOND Business, with independent connection, 1 mile from Central Pharmacy. Good class Dispensing and Family Retail. Full prices. Returns about £900. Premises belong to vendor. Lease may be had. Apply, in the first place, to Vendor, Messrs. Hodgkinson, Stead & Treacher, 198, Upper Whitecross St., E.C.

PRICE £1000.—A genuine old-established Retail and Prescribing Business (of half a century). Position one of the best in Liverpool. Shop handsomely fitted. Takings £900 to £1000 a year. Good profits. All old prices. Completely stocked and in thorough working. No agents need apply. Address, B. B., 80, Shaw St., Liverpool.

LONDON, S.E.—A genuine ready-money Business, chiefly Prescribing. Corner shop. Splendid stock. No opposition. Rent £26. Post Office attached. Taking £40 per month. Ill health cause of disposal. A bargain not often met with. Address, A. B. C., care of Mr. Hammond, 5a, Queen's Rd., Peckham, S.E. No agents.

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MESSRS. GURDEN BERDOE have for transfer:—Warwick. Retail and Prescribing Trade. Same hands 16 years. Returns £550. Good house, large garden, greenhouses, &c. For £300. Gloucester. Retail and Dispensing Trade. Returns £600. Good house. Net profit £230. Unopposed. £450. Kent. Seaside. Elegantly fitted. Retail and Dispensing Trade. Returns £600. Net profit £250. For £500. Another. Delightfully situated. Unopposed. 18 miles out. Returns £300. Neglected. Good house and garden. Offer. Middlesex. Elegantly fitted and well stocked. Returns £700 to £800. Good house. Price about £550. Bargain. London, S.W. Corner. Retail, Dispensing, and Prescribing. Returns £1100. Net profit £500. Owner retiring. £1100. Trial allowed. N. Handsome corner. Well fitted and stocked. Takes £8 weekly entirely by assistant. Excellent residence. £275 to sell quickly. Another. Same hands 10 years. Recently neglected, but returning £4 weekly by assistant. £135. Others from £100 to £3000 on application by letter or personally. Address, 30, Jewry St., Aldgate, City.

BUSINESSES FOR DISPOSAL.

SOUTH.—A profitable light Retail, Dispensing and Prescribing Business. Returns over £300, increasing. Double fronted corner shop. Mahogany fittings and well stocked. Rent £40, on lease. Good dwelling house. No agents replied to. Address, A. R., Messrs. Hodgkinson & Co., Upper Whitecross St., London, E.C.

IN Bankruptcy, re Morris, Brentford.—For sale by private treaty, by order of the Official Receiver. In present proprietor's hands nearly 20 years. Has done £700 to £800 per annum. Shop handsomely fitted and well stocked. 12 years' lease at £42 rent (part let off). Capital house and shop, with large back premises. Izard & Dawe, Trade Valuers, 51, Gracechurch St., E.C.

DISPENSING and light Retail Business (12 miles from London), established as a Branch 6 years. Returns about £600. Long lease upon advantageous terms. Good house. Small garden. Price and full particulars of A. 200, care of Messrs. Davy, Yates & Co., 64, Park St., Southwark, S.E.

A GENUINE going concern.—For £500 cash may be had a good ready-money Business, doing £13 a week. Shop well fitted, and large and commodious corner house in a main road of a London suburb. Strictest investigation courted. Stock good. House and shop in best condition. Address, Eureka, Lomas Farm, Sandhurst, Hawkhurst, Kent.

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SHOP, in the best position of the finest market town in Devon. Population about 4000, good neighbourhood, and only one Chemist in the town. Rare opportunity for a man with good qualifications and business habits. Apply to F. Sage, 80 to 84, Gray's Inn Rd., W.C.

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AN established Retail and Dispensing Business. Town or country. Value £800 or upwards. House must be roomy and in a healthy situation. Full particulars desired, giving extent of premises. Communications direct from principals preferred. Address, W. P. Lawrence, 194, Great College St, London, N.W.

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GLOUCESTERSHIRE.—In main thoroughfare of large town. An old and reliable BUSINESS, with handsome Pharmacy. Capital house, on lease, and garden. Can be transferred for the sum of £650.

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Valuations undertaken for Probate, Transfer, or Arbitration.

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The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

PURCHASERS who desire early information regarding eligible opportunities for entering business, will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

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Terms for valuation on application.

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WATER Mattress, Maw's, fig. 12, 72×36, new, cost £7 net. Ordered for customer and not required. Price, with box, £5. F. WARREN SMITH (late Manning & Son), 7, High St., Yeovil.

"PURE WATER is only to be obtained from NATURAL SOURCES."

Vide LANCET, July 7, 1883.

The continually accumulating evidence that typhoid, diarrhœa, diphtheria, and the allied zymotic diseases and ailments are chiefly induced by the consumption of the ordinary drinking water supplied in town and country indicates the value to the medical profession of an absolutely pure natural mineral water which can be recommended with confidence for daily use.

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The MEMORANDUM of the LOCAL GOVERNMENT BOARD, July 13, 1883.

"*If any taint (however small) of infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of propagating disease.*"

The DAILY NEWS, July 19, 1883, says:

"*London is still supplied with drinking water from open streams exposed to choleraic infection.*"

ST. JAMES'S GAZETTE, Nov. 15, 1883

"*THE RECENT OUTBREAK OF DIPHTHERIA AT CANTERBURY.—An investigation by the sanitary inspector has revealed the fact that there are upwards of sixty polluted wells in the district in which the cases of disease occurred. In every instance the water was contaminated with sewage and swarmed with living organisms.*"

The LANCET says, June 30, 1883:

"*Water is the great carrier of the infective germs. It is the water to which we must look.*"

LANCET, September 15, 1883.

"*All parts of the Thames are polluted with human sewage. The whole Thames, in fact, is at all times polluted with unoxidised sewage matters.*"

REPORTS of the LOCAL GOVERNMENT BOARD.

"*Of 142 epidemics of typhoid fever observed in various localities, in 125 cases the epidemic had no other determining cause than the use of water containing impurities.*"

APOLLINARIS NATURAL MINERAL WATER

"THE QUEEN OF TABLE WATERS."

SOLE IMPORTERS: THE APOLLINARIS CO., LIMITED, LONDON.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 725.] SATURDAY, MAY 17, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-third Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 21st day of May, 1884, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

NOTICE of motion to be proposed at the Annual General Meeting of the Pharmaceutical Society of Great Britain, on Wednesday, May 21st, 1884, by

RICHARD W. GILES.

"That the Council of the Pharmaceutical Society be requested to consider the best means of promoting *systematic Pharmaceutical Research*, either by the institution of a Laboratory and Staff devoted to that purpose, or by such other means as may, after full investigation, appear best calculated to effect the object in view, which shall primarily be the initiation, examination and improvement of contemplated or existing formulæ of the National Pharmacopœia."

CONVERSAZIONE.

By permission of the Lords of the Committee of Council on Education, the Annual Conversazione of the Pharmaceutical Society will be held at the South Kensington Museum, on the evening of Wednesday, May 21st, at eight o'clock.

Each Associate and Apprentice of the Society, and each Chemist and Druggist on the Register, may, on application to the Secretary, obtain a card of admission for himself.

A card of admission has been sent to each Member and Associate in Business of the Society, to admit *himself and a lady.*

N.B.—No person can be admitted *without a ticket.*

THE JACOB BELL MEMORIAL SCHOLARSHIPS.*

TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the Lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships take place on the second Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

Special Notice to Advertisers.—See page ii.

THE THIRTEENTH ANNUAL DINNER

OF THE

Members of the Pharmaceutical Society

AND THEIR FRIENDS

WILL TAKE PLACE AT THE HOLBORN RESTAURANT,

On TUESDAY next, MAY 20th, 1884,

AT HALF-PAST SIX O'CLOCK,

THE PRESIDENT IN THE CHAIR.

COMMITTEE.

THE PRESIDENT.	FREDERICK BARRON.	THOMAS GREENISH.
THE VICE-PRESIDENT.	ISAIAH BOURDAS.	WALTER HILLS.
THE TREASURER.	E. NORTHWAY BUTT.	DR. PAUL
PROFESSOR ATTFIELD.		*Honorary Secretary*, RICHARD BREMRIDGE

Tickets, One Guinea each (including Wine) can only be obtained from the Honorary Secretary,
RICHARD BREMRIDGE, 17, Bloomsbury Square.

Chemists & Druggists' Trade Association of Great Britain.

NOTICE OF ANNUAL GENERAL MEETING.

NOTICE IS HEREBY GIVEN, that the EIGHTH ANNUAL GENERAL MEETING of the Members of this Association will be held in the Banqueting Room of the INNS OF COURT HOTEL, LINCOLN'S INN FIELDS, LONDON, W.C., on Tuesday, May 20th, 1884, at Twelve, noon, for half-past Twelve, for the transaction of the following business:—

To receive and consider the Report of the Executive Committee, and the General Statement of the Funds of the Association.

Mr. Jervis will move that Rule VI. be amended to read as follows:—The Executive Committee shall consist of twenty-four Members to be elected by ballot at each Annual Meeting. Five Members to form a quorum. It shall be the duty of the General Committee to prepare and recommend to the Annual Meeting a list of the names of Members to serve on the Executive Committee for the ensuing year. A President, a Vice-President, a Treasurer, and an Honorary Secretary shall be elected by and from the Executive Committee.

To elect an Executive Committee and Officers for the ensuing year.

To discuss questions affecting the interests of the Trade.

W. F. HAYDON, *Secretary.*

OFFICE OF THE ASSOCIATION,
23, BURLINGTON CHAMBERS, NEW STREET,
BIRMINGHAM, *May 9th*, 1884.

NOTICE TO ADVERTISERS.

THE PHARMACEUTICAL JOURNAL of next Saturday, the 24th inst., will contain—

The Report of the Annual Meeting of the Society.
The Result of the Election to the Council.
Notices of the Annual Dinner, Conversazione, &c.
The Report of the Annual Meeting of the Chemists' and Druggists' Trade Association.

Advertisements for this important Number should be forwarded per return of post. No extra charge, the terms being the same as for ordinary issues, viz., Whole Page, £4 4*s.*; Half Page or Whole Column, £2 2*s.*; Quarter Page or Half Column, £1 1*s.*; Eighth Page or Quarter Column, 10*s.* 6*d.*

Further particulars may be had on application to the Publishers,
J. & A. CHURCHILL, 11, New Burlington Street, LONDON, W.

To the Members of the Pharmaceutical Society.

Having been again nominated as a Candidate at the approaching Election for the Council of our Society, I wish to indicate in a few words the grounds upon which my acceptance of the nomination are based, and more particularly with regard to the principal questions which are just now of vital interest to us.

In soliciting the support of all those who may find their views to be more nearly in accordance with my own, I would assure them that it will be my honest endeavour to deserve their help by diligent interest in and steady support of those principles which are calculated to be the best for the future welfare of Chemists as a whole.

It is a cause for great regret that the Society does not enjoy the popularity and consideration which might fairly be claimed by its inherent importance, neither on the other hand does it receive the general support that should be accorded it. I should therefore cordially agree with and advise any means whereby the hands of the Council would be strengthened for the benefit of the Members of the Society, both in the Educational and Professional relations of their career, besides assisting them by a watchful interest of their rights as defined by the Pharmacy Act.

As one of the younger branch of Pharmacists who for the last few years have been gaining experience in the peculiar requirements of the day, and upon whom the future of Pharmacy must depend, it appears to me advisable that such section of our body should be represented at the Council Board.

It will be necessary for the new Council to consider afresh the clauses of the Pharmacy Act Amendment Bill, recently rejected by the Government, and more especially those affecting the questions of Education and Examination.

I am not in favour of the scheme as drafted in the present Bill, but should support one which would in my opinion more generally meet the wishes and needs of the whole of our profession, and not a minority.

Briefly then, the dual system of qualification I do not think it necessary or advisable to maintain in its present state, but by altering the character of the Minor Examination, and regarding it, in the new form, as a test by which the Student can qualify as an Assistant, the ground would be cleared for a satisfactory curriculum, for a period very little, if any, longer than the average time now passed by the Students at the Pharmacy Schools. The Major would then remain the only examination qualifying one for business with the title of Pharmaceutical Chemist.

With regard to the Poison Regulations, I consider the interests of the public would be best served if medicine of all kinds, whether Patent or Proprietary, if containing Poisons, should be so declared, and come within the meaning of the Poisons Act, then to be vended only by those who have been declared qualified to deal with such remedies.

One will be better able, however, to consider the many bearings of the question more in detail, when the text of the promised Government Bill is issued.

In conclusion, I would take this opportunity of thanking all those who recorded their votes for me at the Election of 1882.

Faithfully yours,

11, Strand, Torquay. *April* 30, 1884. **CHAS. SHAPLEY.**

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THE BRITISH AND COLONIAL DRUGGIST. Published 25th of each month. Special articles. All the trade news of the month. Students' department. Legal inquiry column. Three prize competitions. First prize £10. Annual subscription 6s., post free. Single copies 8½d., post free. First issue in May. 28, Paternoster Row, E.C.

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Applications for such agencies are invited for those districts which are not yet represented.

80, COLEMAN STREET, LONDON, E.C., 16*th April*, 1884.

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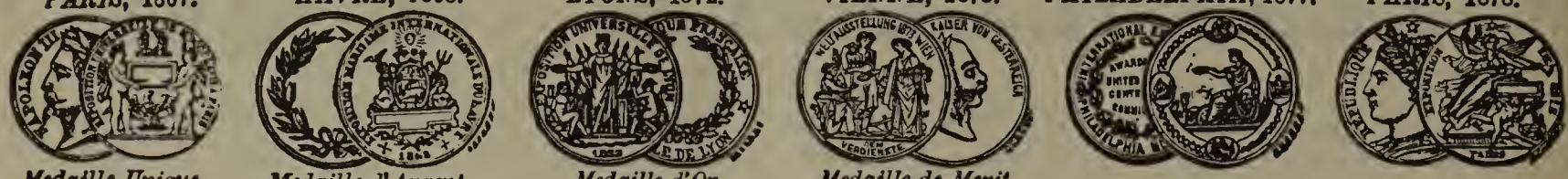

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CAUTION.—Numerous inferior and low-priced substitutes being in the market with misleading titles, labels and portraits of the late Baron Liebig, purchasers must insist upon having the Liebig Company's Extract of Meat.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

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The original Manufacturers of Essence of Beef (green label under wrapper), and other Specialities for Invalids, have

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From their SOLE ADDRESS, No. 11, LITTLE STANHOPE STREET, MAYFAIR, W., and caution the trade to

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PRICE'S PATENT CANDLE COMPANY (Limited).

Works:—Battersea, London, & Bromborough, Liverpool.

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DISPENSING.—Green and White Flint, of all sizes and shapes.

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LIQUOR BISMUTHI. SCHACHT.

Dose, ℥j, diluted.

Great pains are taken to ensure the absolute purity of this preparation. It is not only freed from the ordinary contamination of the metal, such as copper, arsenic, silver, &c., but that which so frequently causes an offensive odour to pervade the persons of those taking the ordinary preparations of Bismuth, namely TELLURIUM, is also most carefully eliminated.

Syr. Cinchonæ Alcoholicus, Schacht.

Bark minus the woody fibre. Dose, 10 to 30 drops, diluted.

Liquor Rhamni Frangulæ, Schacht.

A real aperient, mild and constant. Dose, ℥ij to ℥iv, diluted.

Syrupus Sennæ Aromaticus, Schacht.

Made by cold maceration—does not gripe. Dose, ℥j to ℥ij.

Succus Fuci Vesiculosi, Schacht.

The preserved conceptacular juice of the plant in its most active condition. This preparation has been used with excellent results, both internally, and also as an Embrocation in Rheumatism, &c. Dose, ℥j to ℥ij.

The above Preparations are manufactured by Mr. Schacht himself in the laboratory of the firm.

GILES, SCHACHT & CO.

52, ROYAL YORK CRESCENT,

CLIFTON;

And can be procured from

BARCLAY & SONS, W. EDWARDS & SON, and all Wholesale Druggists in London and the Provinces.

FOR CHEMISTS.

THE CELEBRATED LONDON TEAS

TRADE MARK REGISTERED.

"*I CERTIFY, after examination of the Books of the GREAT TOWER ST. TEA COMPANY, LIMITED, that during the Year* 1883 *the SALES of their undernoted STANDARD Teas exceeded those of the Year* 1882, *in each case by the percentage thereon named below.*

The CHOICE CHINESE SMALL TEA For Retail at 1/4.	..	**72 per cent.**
The LONDON WHOLE-LEAF TEA For Retail at 1/8.	.. ..	**18 ,,**
The LONDON BROKEN TEA For Retail at 1/8.	.. .. ..	**22½ ,,**
The LONDON 2/- TEA For Retail at 2/-.	.. ..	**18½ ,,**
The LONDON 2/4 TEA For Retail at 2/4.	.. ..	**42½ ,,**
The LONDON 2/6 TEA For Retail at 2/6.	.. ..	**55 ,,**
The LONDON ASSAM BROKEN TEA For Retail at 2/8.	..	**16 ,,**
The LONDON 3/- TEA For Retail at 3/-.	.. ..	**62 ,,**
The LONDON 3/8 TEA For Retail at 3/8.	.. ..	**90 ,,**

ERNEST HOLAH, *Chartered Accountant*,
30, BUDGE ROW, CANNON STREET, E.C.
Dated, LONDON, *January 17th*, 1884."

These well-known Teas, when ordered packed, are hand wrapped from the bulk, and forwarded on the day the order is received.

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Near Frankfort-on-the-Maine.

The HOMBURG WATERS are very EFFICACIOUS and SALUTARY in diseases of the STOMACH and LIVER and in attacks of the GOUT.

UNRIVALLED SUMMER CLIMATE. SOVEREIGN CURE IN NERVOUS DEBILITY. The pure and bracing air from the mountains contributes largely to invigorate the system.

GRAND BATHING ESTABLISHMENTS, where baths of MINERAL and soft water are given, under medical prescription, with addition of MOTHER-LYE, EXTRACT OF PINE, liver of SULPHUR, &c. MOORBATHS highly recommended for rheumatism.

INHALATION from VAPORIZED SALT WATER for affections of the THROAT and the LUNGS.

Two Establishments for COLD WATER CURE, one of them in conjunction with a Gymnastic-orthopædic Institution.

WHEY CURE and Goats' Milk. All kinds of Mineral Waters can be obtained.

First-class Orchestra, Regimental Bands, Balls, Réunions, Operas, Grand Concerts, Illuminations, Fireworks. Fêtes, Champêtres, &c. Toupie Hallandaise, Bagatelle, CRICKET and CROQUET, LAWN TENNIS. Good Shooting and Fishing in the neighbourhood.

Elegant KURHOUSE with LADIES' CONVERSATION and READING ROOMS, open all the year. CAFE, BILLIARDS. The former RESTAURANT CHEVET under the same management.

Beautiful PARK with shaded walks and comfortable seats. Extensive Carriage Drives through a vast Pine Forest. CHARMING ENVIRONS.

PURE AND LIMPID DRINKING WATER. Excellent drainage. Every condition of Hygiene fulfilled. Superior Hotels and Lodging Houses at moderate prices. Half an hour's railway ride from Frankfort-on-the-Maine.

THE MINERAL WATERS EXPORTED TO ALL PARTS OF THE WORLD.

W. J. BUSH & CO.

DISTILLERS AND IMPORTERS OF

Essential Oils and Fruit Essences, &c.

SOLUBLE ESSENCES FOR AERATED WATER,

DOUBLE THE STRENGTH OF ORDINARY SUPER QUALITIES.

W. J. B. & CO. caution the trade against the so-called soluble Essences now so frequently offered for sale, which are nothing more than mere tinctures, and, although offered at lower prices, cost five or six times as much in use, whilst imparting a strong medicated flavour.

The importance of our invention of Soluble Essence is clearly shown by the numerous imitators and copyers that have sprung up, and we must inform the Trade that ours are the only **Genuine Original Soluble Essences.**

FRENCH CREAM GUM EXTRACT.

Protected by Royal Letters Patent. For producing a head of creamy richness upon all kinds of

Syrups, Aërated Waters, Beers, Ales, Cider, &c.

W. J. BUSH & CO. regret having to caution the trade against spurious imitations of this article, most of which being mere rubbish.

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ENGLISH DRAWN ESSENTIAL OILS

OL. AMYGD. ESSENT. ANG.
" AMYGD. " (SINE ACID. PRUSSIC)
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" SANTAL. FLAV. ANG.
" MENTHPIP MITCH. RECT.
" PIMENTA ANG.
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GOLD MEDAL.—CALCUTTA EXHIBITION, 1884.

ANALYTICAL REPORTS ON

"CARNRICK'S" BEEF PEPTONOIDS

By Professor ATTFIELD, F.I.C., F.C.S., &c., Author of "A Manual on Chemistry, General, Medical, and Pharmaceutical.

The chemical examination to which I have submitted "Carnrick's" Beef Peptonoids yields the following results, in 100 parts.

Albuminoids (containing nitrogen, 10·94)	**69·25**
Fat...	**10·71**
Sugar, including a trace of starch ...	**9·50**
Phosphates equal to bone phosphate ...	**3·01**
Other mineral substances...	**2·61**
Moisture...	**4·92**
November **18***th*, **1883.**	**100·00**

The manufacturers of "Beef Peptonoids state that this food is composed of dry lean of beef, one third; the solids of milk minus most of the fat, one third; the gluten of wheat, one third; the beef being partially digested or "peptonised." My analysis fully supports this statement, for I find present between 69 and 70 per cent. of albuminoids—that is, flesh-forming material (nitrogen 10·94); more than 20 per cent. of warmth-producing substance, nearly half of which is milk sugar, and rather more than half fat; 3 per cent. of bone-forming phosphates; about 2 per cent. of other normal mineral matter; and about 5 per cent. of moisture. A sample of the consistent gluten submitted to me was practically pure, containing a mere trace of starch. Rather more than one-fourth of the albuminoids, probably the "peptonised" portion, was soluble; while practically the whole of the "Beef Peptonoids" was readily soluble in peptonising fluids, showing that it is easily and wholly digested when taken into the stomach. The flavour and odour of the preparation are excellent; its thorough state of dryness fits it for keeping for any length of time in any climate. It is by far the most nutritious and concentrated food I have ever met with. Indeed, a palatable and assimilable, and in every way acceptable article of food, containing nearly 70 per cent. of truly nutritive nitrogenous material partially peptonised, has never before, to my knowledge, been offered to the medical profession or to the public.

By Professor CHARLES R. C. TICHBORNE, LL.D., F.C.S., M.R.I.A., &c.

Dublin, March 17th, 1884.

I have submitted a sample of "Carnrick's" Beef Peptonoids, made according to his latest improvements, to a careful chemical examination. The results show me that he has greatly improved this really extraordinary flesh-forming food. I find that this preparation is a very highly concentrated and complete food. It may be divided as follows:—Flesh-formers, 70·00; heat-givers, 19·02; mineral food, 6·14. The constituents classed as mineral food have the composition of the blood salts, and consist of the alkaline phosphates, with iron. Taking into consideration the perfect digestibility of the "Beef Peptonoids," it is the most concentrated nitrogenous food I have ever examined. It is in the form of a dry powder, having a bright brown colour, an agreeable odour, and a pleasant taste. It may practically be said to be soluble. I should say that the keeping properties of this preparation ought to be very good. It has evidently been very carefully prepared, and has been submitted to a process of drying, which leaves it in a condition to stand without change in all climates. The "Beef Peptonoids" will be invaluable both to the physician in cases where it is desirable to give animal foods in the liquid form, and from the nature of the preparation it will be doubly valuable where the patient's stomach is in a weak condition.

By Dr. STEVENSON MACADAM, F.R.S.E., F.C.S., F.I.C., &c.

Analytical Laboratory, Surgeons' Hall,
Edinburgh, January, 21st, 1884.

I have to certify that I have made a careful chemical analysis of Beef Peptonoids, and find it to be a highly nutritive food mixture. It is a fine yellow powder, with an *agreeable odour*, perfectly free from any taint or tendency to putrescence or decay, and from the apparent care which has been taken in its preparation from the best materials, and its dryness, it will withstand change for any period of time and in any climate. It is by far the *most concentrated nutritive combination or essence of food which I have ever met with*, and when made up according to directions it is *thoroughly palatable*, is *most easily digested*, and is eminently suited for the administration of food elements, especially to invalids and children in cases where the digestive and assimilative functions are weak and impaired. I am therefore confident that the Beef Peptonoids will be found an invaluable aid during illness, and an excellent help during convalescence.

By Dr. STUTZER, Director of the Imperial Agricultural Chemical Laboratory for Rhenish Prussia.

Bonn, March 19th, 1884.

I have carefully examined a sample of "Carnrick's" Beef Peptonoids, and have not only tested in this analysis the ingredients, but also their digestibility. The preparation is an extremely fine, dry powder, and it is shown by the microscope that its components are very thoroughly mixed, and on account of their fine division will be easily accessible to the digestive juices. The nitrogenous material coming partly from meat and partly from gluten, has been examined upon its particular ingredients and its digestibility, and the result of the repeated confirmatory examinations was, that of 100 parts of the nitrogenous substance—

97 parts consisted of easily digestive albumen and peptone.
1 ,, ,, meat creatine.
2 ,, ,, substance difficult to be digested.

The digestibility of the nitrogenous substances, therefore, is *extraordinarily favourable*. The same can be said of the substance free from nitrogen, because the quantity of the cellulose coming from the vegetable substance is very small. The salts contain 1·27 per cent. phosphoric acid, corresponding with 2·77 per cent. lime-phosphate. This exceptionally high nutritive value is especially caused by the great quantity of easily digestive albuminoids; whilst the analysis of other foods showed the following contents of digestive albuminoids:—Caviar, 25 per cent.; Beef, 18·53 per cent.; Fowl, 16·56 per cent.; Mutton, 18 per cent.; Egg, 13 per cent.; Nestle's Children's Flour, 10 per cent.; Bread 7·20 per cent.; Oysters, 6 per cent.; Milk, 4 per cent.; Liebig's Meat Extract, 3·40 per cent.; Potatoes, 1 per cent. The *odour* and *flavour* of the Peptonoids are *exceedingly pleasant*, and better than any other preparation of meat with which I am acquainted. Owing to the results obtained by the chemical, microscopical, and physiological analyses, I cannot refrain from giving this preparation, as a *most valuable* and easily digestive nitrogenous food for invalids and convalescents, *my fullest endorsement*.

We shall be pleased to have the Profession everywhere test the value of this preparation, and for that purpose we shall be happy to send a sample to any regular practitioner desiring it.

THE MALTINE MANUFACTURING COMPANY, LIMITED,

24 & 25, HART ST., BLOOMSBURY, LONDON, W.C.

WARAS.

BY W. T. THISELTON DYER, C.M.G., F.R.S.

Perhaps I may be allowed to add a few remarks to what is stated about "waras" in Mr. Kirkby's interesting paper in the last number of the *Pharmaceutical Journal*. The note contained in the inclosed copy of the 'Kew Report' for 1880, p. 50, is, I believe, the origin of the identification of the plant producing the Aden drug with *Flemingia congesta*.*

Professor Flückiger, with whom I had corresponded upon the subject, informed me (July 12, 1881) that though he at first objected to *Flemingia* as the source of "wars" he then thought the statement correct.

As the Kew Museum contained no satisfactory specimens of either African or Arabian "waras," we applied to the Resident at Aden to kindly assist us in procuring samples. These reached England in July of last year. In both cases the "waras" itself agreed microscopically with an authentic sample derived from Professor Flückiger, and had the structure figured by Mr. Kirkby. All three also exhibited the characteristic property of turning first bright red, then black, when carefully heated in small quantity on a glass slip over the flame of a spirit lamp.

The sample of Somali "waras" was mixed with seeds of a dull brown colour mottled with black. These were found to agree precisely with the seeds of *Flemingia rhodocarpa*, Bak., from the Mozambique, which, as mentioned in the 'Kew Report' (*l.c.*), "has its pods covered with a bright red resinous pubescence." A further scrutiny of the original specimen obtained by Captain Hunter from the neighbourhood of Aden, which is in a rather immature state, led Professor Oliver to the conclusion that this also belonged to *Flemingia rhodocarpa*. I believe that the drug is derived from the young pods and am disposed, therefore, to think that Dr. Dymock is in error in describing it as "the gland of the leaf."

I communicated these further facts to Professor Flückiger, and he wrote to me, October 4, 1883, "I am very much pleased with your statements and can only say, that I most fully agree with your conclusion as to the identity of the Somali 'waras' with my original specimen and also that of the seeds of *Flemingia rhodocarpa* with those met with in the said drug."

In the new 'Official Guide to the Museums of Economic Botany at Kew' (No. 1, p. 45) we accordingly state that "waras . . . . consists of the epidermic glands of the young pods of *Flemingia rhodocarpa*, Baker, native of Arabia and East Tropical Africa."

The third variety described by Mr. Kirkby is quite new to me and I join with him in hoping that some further information about the plant yielding it will soon be forthcoming.

* The following is the note referred to:—

"*Waras*.—A drug known under this name appears to be exported in considerable quantity from Aden. It is used as a substitute for kamala, a well-known Indian product of *Mallotus philippinensis* (*Rottlera tinctoria*, Roxb.). Its origin is quite unknown (*see* Flückiger and Hanbury, 'Pharmacographia,'' pp. 575, 576). At the suggestion of the former, Captain Hunter, Assistant Resident at Aden, obtained specimens of the plant stated to yield waras in Arabia. He has also sent one to Kew with a note stating that it was gathered 'at an elevation of 6000 feet on Jebel Dthubarah, 60 miles due north of Aden.' The plant sent was immediately identified with a leguminous species, *Flemingia congesta*, Roxb., having of course no affinity with *Mallotus philippinensis*.

"True kamala consists of the epidermal glands detached by brushing from the fruits of the *Mallotus*. Alcohol extracts from it a splendid red colour. The name 'waras' means saffron, and it may be mentioned in support of the notion that a similar substance is yielded in Arabia by perhaps one or more species of *Flemingia*, that dried specimens belonging to this genus stain paper in the herbarium a bright yellow colour when washed over with the alcoholic solution of corrosive sublimate used to protect them from the attacks of insects. *Flemingia rhodocarpa*, Bak., from the Mozambique district has its pods covered with a bright red resinous pubescence.

"In the 'Pharmacographia' (2nd ed., p. 372), Flückiger and Hanbury state that *Mallotus philippinensis* grows in Abyssinia and Southern Arabia. In a letter, Professor Flückiger doubts whether he and Mr. Hanbury were not mistaken in regard to this. The evidence of specimens in the Kew Herbarium only carries the distribution to the west as far as Scinde. There is nothing improbable in its extending to Arabia, the flora of which is still so imperfectly known."

CODEINE HYDROBROMIDE.

BY D. B. DOTT.

Codeine is the strongest of the opium bases, replacing all the others in solutions of their salts. Yet, probably for more than one reason, the salts of codeine are not much in demand, the alkaloid itself being more generally used. As the hydrobromide is sometimes required, I thought that a note of its principal properties might be of some interest, especially as the salt has not been previously described, at least so far as I have observed.

Codeine hydrobromide crystallizes from an aqueous solution in radiate tufts of four-sided prisms. The solubility in water was determined by digestion at a temperature below 60° F. for twenty-four hours, then at 60° for two hours, when portions of the solution were weighed and evaporated to dryness on a water-bath.

a. 165 grs. solution left 1·93 grs. = 1·97 grs. 2-hydrate.

$$\frac{165-1\cdot97}{1\cdot97}=82\cdot75.$$

b. 144·25 grs. left 1·70 = 173 grs. 2-hydrate.

$$\frac{144\cdot25-1\cdot73}{1\cdot73}=82\cdot38.$$

The solubility in water at 60° F. is, therefore, approximately 1 in 82·5.

With the heat of a water-bath 8·04 grs. of the air-dry salt lost 0·17 gr. = 2·11 per cent. $C_{18}H_{21}NO_3.HBr.2H_2O = 2\cdot16$ per cent. for $\frac{1}{2}$ H_2O. In the air-bath at 115° C. 5·74 grs. lost 0·485 gr. = 8·44 per cent. $C_{18}H_{21}NO_3.HBr.2H_2O = 8\cdot65$ per cent. for $2H_2O$. It is, therefore, evident that the hydrobromide like the hydrochloride loses a fourth part of its combined water at the temperature of the water-bath, and the remainder at some temperature above 100°. But we must not deal in fractions of molecules, so we ought to write the formula $(C_{18}H_{21}NO_3.HBr)_2$, $4H_2O$, or more accurately (having in view the researches of Dr. Wright), $C_{36}H_{42}N_2O_6.2HBr.4H_2O$. We may, of course, use the empirical formula when more convenient, just as we sometimes write the erroneous expression $FeCl_3$ instead of Fe_2Cl_6.

THE CHEMICAL PHARMACY OF THE NEW PHARMACOPÉE FRANÇAISE.

(*Continued from page* 900.)

This section forms the second part of the Codex Medicamentorius; distinguished by the blue edging of the leaves; the preparations being arranged like the preceding in alphabetical order, the acid radical in compounds being put first and in the vernacular.

The list includes mineral and organic substances, as they occur native, or in a purified condition; metallic bodies and their salts; certain miscellaneous substances, including amber (succin), coal-tar (goudron de houille), and petroleum (pétrole d'Amérique). When possible their formulæ, with indication of their Equivalent and Atomic weights, are given side by side.

In many cases the mode of preparation has been subjoined, omitting for the most part manufacturing commercial processes, though the rule has not been rigidly observed. The larger chemicals have their distinctive characters and properties described. Calomel (protochlorure de mercure) and benzoic acid: as well as similar preparations on the large scale hold their place amongst such chemicals as can or ought to be furnished by the pharmacien; if so, French pharmaceutical chemistry must be credited with higher laboratory work than prevails in England. Foreign criticism enlarges on this point, especially when discussing the elaborate directions given for the manufacture of essential oils, which would hardly be undertaken by the average retail pharmacien.

The fault is on the right side, and should these directions prove useful to those for whose benefit they are intended, they are to be congratulated on their advanced position.

Tests of purity are given when required, and possible adulterations noted; substances deemed poisons are specially marked as such.

The alkaloidal strength is stated in case of salts with organic bases for the guidance of the medical profession. Various chemical products, no longer used in medicine, have been eliminated; while about eighty new substances have been introduced.

As already a revision of the published text of the new Pharmacopée is under the consideration of a Committee, headed by M. Petit; it will be needless to specify the exact relation which the Codex of 1884 bears to its predecessor of 1866. The intention contemplated in this notice is to bring forward such official preparations as are in themselves distinctive, and a knowledge of which may be of service to the English reader.

The introduction of salicylic acid and some of its salts; of ésérine; chloral; chloroform newly described and its characteristics mentioned in detail; iodoform; the sulphates of cinchonidine and quinidine; pilocarpine; the tannates of pellétiérine (a tænifuge) and quinine; and notably of certain bromides and bromhydrates, may, however, be enumerated.

Three terms in constant use must be understood.

Aq=aquâ means always water of crystallization. Thus, carbonate de soude pur cristallisé:—

CO_2,NaO; 10 aq. in French equivalents=143

or expressed by

$CO_3Na_2+10H_2O$. F. atom (formule atomique)=286.

Readers who wish to work out the equations contained in the Codex must consult the table of Corps Simples (Elementary Bodies) printed on page 25 of the Notions Préliminaires.

It will be noticed throughout that two systems of Notation are used; the one based on the equivalent system, *i.e.*, 1 part of hydrogen by weight unites with 8 of oxygen to form water; the formula becomes HO and the combining weight of oxygen 8. The other system is based not on analysis pure and simple, but the combining weights regulated by the laws of specific heat, and vapour density; in fact, the atomic weights as usually recognized in England. In the first, hypothesis is ignored, whereas the second is entirely dependent on it.

A straight line drawn through a symbol marks dyad relation in the printed formulæ.

Altér.=Altérations. Foreign substances which a product may contain owing to incomplete purification. When these are indicated by italics, substances most frequently occurring are designed.

Fals.=Falsification. Foreign substances fraudulently introduced. The term corresponds to our word adulteration.

While in the list of materia medica an asterisk is added to such substances as should be found in every pharmacy, the pharmacien is left to his own discretion in the subsequent sections; a matter of little importance regarding chemicals, and of none in the galencial department, since the preface states authoritatively that it contains such official remedies as should always be in readiness for the prescriber.

Amongst important additions sundry applications of bromine and hydrobromic acid deserve attention. French critics are warm upon the subject of the circumflex accent being placed over the bromine compounds, as Brômure de Potassium in the text, though Brome itself appears without. This printer's arrangement is not invariably adhered to, as may be seen in the general index. Littré is dragged into the argument, and our neighbours must settle their own orthography. Judging from etymology we should pronounce the Codex in the right, and both Chrôme and Brôme have the circumflex in the table of Corps Simples, both having the same Greek authority.

Hydrobromic acid is ordered both gaseous and in solution. The acid is prepared by the action of bromine on melted paraffin; and it can be used directly as gas, or passed into water at 0° when the solution will contain about its own weight of gaseous acid. The solution can be made by acting on dilute sulphuric acid by crystals of bromide of barium; or by passing the gas into distilled water to a density of 1·077, a 10 per cent. solution is obtained.

The hydrobromates are eight in number; that of ammonia corresponds to our ammonium bromide.

The *Bromhydrate of Cicutine* is prepared by passing hydrobromic acid through an ethereal solution of cicutine. The salt being insoluble in ether is precipitated as pulverulent and colourless crystals, which are collected, further washed with ether and rapidly dried. The salt is purified by spontaneous evaporation from a cold saturated solution. One hundred parts contain 61·06 cicutine.

Bromhydrate of cinchonidine (basic) is made by acting on basic sulphate of cinchonidine with bromide of barium and boiling distilled water. Wash out the sulphate of barium; evaporate and crystallize.

Bromhydrate of cinchonidine (neutral) is so rendered by means of dilute sulphuric acid.

Eserine (the process of its extraction from Calabar bean being given in detail) forms one of the bromhydrates. It is simply dissolved in hydrobromic acid, sufficient being added to effect a perfectly neutral solution. Evaporate over a water-bath to a syrupy consistence, and allow it to crystallize for some days. The salt thus made is in fibrous masses, usually of a reddish-yellow colour, and not deliquescent though very soluble in water.

Sulphate of Eserine is also official; made by treating an ethereal solution of eserine with a 10 per cent. dilute sulphuric acid. The salt is directed to be collected and dried by spontaneous evaporation. This method of drying does not seem in keeping with the sentence which immediately follows. "The sulphate of eserine thus obtained is amorphous. It can be crystallized, but with difficulty, on account of its extreme deliquescence." Eserine, as is well known, contracts the pupil.

Of the remaining bromhydrates that of morphine is a simple solution in the acid in hot water. Evaporate over the water-bath and crystallize out the salt, using as drying agents concentrated sulphuric acid, or dry calcium chloride. Solubility in cold water 1 : 25.

The *bromhydrates of quinine*, basic and neutral, call for scarcely any remark. Bromide of barium, being converted into a sulphate, is washed out; and the soluble salt is evaporated and crystallized. In the neutral bromhydrate, dilute sulphuric acid is employed.

Monobrom camphor, and the bromides (bromures) of lithium, potassium and sodium are included in the bromine series. Lithium carbonate and citrate are also official.

It will be well to recollect that brômiure ferreux (bromide of iron) is not a solid salt, but a solution containing one third of its weight of ferrous bromide. This must be borne in mind by the English dispenser when making pills of bromide of iron according to the Codex. The matter will claim attention when treating on the galenical section.

It should be stated here that the word "officinal" attached to a preparation generally indicates, and always in the case of acids, that which has been made or purified for medicinal use. Thus we get commercial sulphuric acid, and the officinal, which is the former in a pure state. Hydrocyanic acid is HCy; but a centesimal solution, under the name of acide cyanhydrique dissous, au 100e, the process for its manufacture being given in detail, is the "officinal" or the one to be used in medicine.

Acide phosphorique officinal is the solution made by acting on red phosphorus by nitric acid. By officinal, therefore, is not only meant that the substance is ordered by authority, but that it is presented in the form in which it may be therapeutically exhibited.

The progress of pharmaceutical chemistry has necessitated the introduction of *salicylic acid*, and we find the *salicylates of lithium*, *quinine* (basic) and of *sodium*. To make the second, salicylate of sodium is dissolved in water, and to the solution, boiling, the sulphate of quinine is added. The insoluble salicylate is washed and dried, and carefully tested for absence of undecomposed sulphate.

Acide sulphydrique dissous, a solution of sulphuretted hydrogen, occupies a prominent position, though the English pharmacist would rather assign it a place in a purely chemical treatise. It is directed to be prepared, many necessary precautions being observed, by acting on powdered sulphuret of antimony (Sb_2S_3) mixed with sand, with commercial hydrochloric acid. Gentle heat is to be applied when the action flags or is less energetic. Otherwise a cold process is employed. The gas may be conveniently passed into a mixture of four parts water and one part glycerine, to retard decomposition on exposure to the air.

Permission is likewise given to prepare sulphuretted hydrogen either by acting on protosulphuret of iron by $HCl + 2H_2O$; or by $H_2SO_4 + 8H_2O$.

A useful note is appended to sulphuric acid. The commercial article obviously should be restricted to external use on account of the lead and arsenical compounds it may contain. When this impure acid is rectified on an extensive scale, avoid the choice of larger retorts; multiply their number.

Acetic acid (1·060) replaces distilled vinegar in the obsolete Esprit de Mindèrer. Acétate d'ammoniaque liquide (liquor ammoniæ acetatis) is now made by mixing distilled water and acetic acid with the aid of a gentle heat; sesquicarbonate of ammonia is added until feebly alkaline. No water appears in the formula of 1866; the result is otherwise the same.

Acide azotique is not a synonym, but in all the glory of an official title reappears and indeed supplants that of nitric acid. Not that the latter was ever entirely banished, for though rejected by pharmacy, chemistry retained its services. We had thus in olden times acidum nitricum officinale with the formula $AzO_5,4HO$, and nitrate d'argent with the formula $AgOAzO_5$. According to new directions we must read azotic acid, with its salts the azotates.

Eau Régale (*Aqua Regia*).

is thus made:—

Acid. nitric pur.	4
Aq. destillat.	1
Acid. hydrochloric. pur.	15

Mix the nitric acid with the water; add the hydrochloric acid, and keep in an unstoppered bottle for some days.

Benzoic acid, both prepared by sublimation or by the wet process is minutely described with full details of manufacturing process. Neither need occupy attention, as the methods indicated are not likely to be followed by English pharmacists.

The benzoates are made by neutralizing solutions of alkalies with benzoic acid and subsequent crystallization.

In this manner the benzoates of ammonia, lime, lithium and sodium are formed.

(*To be continued.*)

SCANDINAVIAN PHARMACY.

ADAPTED BY JOSEPH INCE.

(*Concluded from page* 760.)

We must now see whether the laboratories, botanical gardens, and collections of natural history are in keeping with the programme which is sufficiently exacting.

By good fortune Monsieur Labonne was able to inspect them in the completest manner, and he pays incidentally a just tribute to the hospitality of these "Frenchmen of the North."

One day when with some friends he was visiting the ancient cathedral of Upsala, a young law student came up to them and said in the best French he

could command, "Will you let me act as guide? Unfortunately I have never travelled in France, and have only learnt French in our academies; I shall be happy to speak with you for practice and see how many faults I make."

Monsieur Labonne having informed him that he himself was a pharmacien from Paris, and also a medical student, the friendly guide proposed to introduce him to two other students of pharmacy and medicine. No sooner said than done. In company of these two the party went to visit the pharmaceutical collections. Professor Frietz, M., took them everywhere. He is a professor of Botany who enjoys the same reputation in Sweden and even in Germany, as Professors Chatin and Baillon do in France. First they inspected the Botanical Garden, the plants being arranged according to the system of Linnæus; then the rooms which are so well arranged for vegetable micrography; and lastly the hot-houses of which the people of the North possess the secret. They delight in having tropical plants in a climate of ice. Amongst other things a mulberry tree was observed planted by Linnæus's own hands. The Swedes reverence their compatriot and are proud of him. A monument has been erected to him in the cathedral; it is a pyramid of porphyry bearing a bronze medallion portrait with this inscription—"Carolo Linné botanicorum principi amici et discipuli. 1798." The house also was shown which he inhabited when he was Professor at the University of Upsala.

The laboratories of physics and of chemistry are likewise irreproachable. One can judge of the general instruction of the country from the following episode:—The law student knew quite as well as the party he conducted, the names of all the plants met with on their walks. A Paris student of law would scarcely be expected to know as much, and perhaps not even a medical student. The plants are with few exceptions the same as in France; only for the same species the colours differ strikingly, for example, in the larkspur. Certain flowers, much neglected in France, are much used in Sweden and Norway.

First must be cited *Epilobium hirsutum*, whose lovely red petals form the background of the marvellous beauty seen in the immense meadowland of Sweden, those fertile and flowery meads. It attains the height of more than a yard, or yard and a half, and dominates the rest. Its bright colour, slender stalk and abundance, arrest the attention of the traveller. One is sure to find it on the way, and it is so faithful a companion that it is met with as far as the arctic circle. The peasants utilize it as food; they drag it out of the ground with the least possible injury to the roots. These roots are dried on hurdles during fine weather, and in the winter vary somewhat their poor vegetables.

Beyond the arctic zone there is a species of sorrel which serves the same purpose.

Oxyria reniformis. It is preserved by congelation; later on, when wanted, it is converted into a pulp by boiling.

The Lapps to keep themselves from scurvy use a very bitter plant, the *Mulgedium alpinum.* They mix it with their bread steeped in reindeer's milk. This kind of pottage must be particularly esteemed, for the day when Monsieur Labonne paid them a visit in one of their chief camps near Troms, he was offered some and was placed on the Boasso. This is a great stone near the hearth, and is the seat of honour in the smoky hut. The *Mulgedium* turned out as bitter as Gentian.

Another plant found in great abundance is the meadow-sweet (Ulmaire). The air in this cold climate is literally saturated with the odour of its numerous white flowers, to the inconvenience of the traveller. Norway and Sweden confirm the law, that flowers of the same species have more perfume in the north than in the south. The extreme solar radiation volatilizes the odorous principles. Everyone knows that in France flowers exhale the least odour in the middle of the day. The sweet scent of the lime trees struck the party. The walks of Christiania are thus perfumed. There is nothing similar to this in the south of France.

It is also very curious to note the rapidity with which certain species belonging to southern regions develop far in the north. Thus planes, *Acer platanoides*, transplanted from Christiania to Troms (70° N.), become extremely vigorous; their leaves are much broader, and their branches much more numerous. It would be very interesting to study with care the effect produced by *a day of several months without a night* on the colour of flowers and the taste of fruits. Such researches have never been undertaken; unfortunately a long residence in these countries would be required.

The *Vaccinium uliginosum* will exhaust the list of plants not utilized in France for food, but precious in that respect in these regions.

Monsieur Labonne first saw this small shrub on the railway. One afternoon on the way to Christiania, little boys, with bare feet, darted out from the depths of the fir woods, and threw handfuls of small green branches at the driver of the train. This was several times repeated and the driver caught the bunches with extreme dexterity. Asked for an explanation, he laughed and bit the small blue berries between his teeth with great gusto. They seemed quite appetizing, especially in a country where there were no grapes, and where one had to regret somewhat the leeks of Egypt, that is to say the fine rich fruits of France. The berries had a rather agreeable acidulous taste, reminding one a little of the grape. The leaves quite resembled those of uva-ursi, which is a broad hint for those who practise adulteration. It was not whortleberry but the *Vaccinium uliginosum.* The shrub was met with everywhere, even at the North Cape, and the berries served to assuage thirst. It was too abundant for it formed the seasoning of all kinds of sauce for fish and flesh.

On the shores of the Arctic Ocean this plant is the sole representative of a scanty vegetation. There, better than the busserole, it deserves the name *bear's grape*, for it literally forms the chief sustenance of that animal in these parts. After this slight digression into botanical details the fauna of Scandinavia must be noticed; and some products special to the country.

The reindeer (*Cervus tarandus*) is the first animal which presents itself to view. The name is from a Swedish word denoting either cleanliness or swiftness, for *rheen* signifies, clean and rānna, means to run. At the present moment the animals are seldom met with wild, but they are seen in droves under their owners' charge. Near Tromsö from five to six hundred were encountered together in one valley. To enjoy this sight previous notice must be given to the Lapps; else there will be very few to show, the main herd being sent to feed upon the mountains. The Lapps

who have been demoralized by contact with civilization, demand thirty francs for thus assembling their herds, alleging a pretended loss. This tax must be paid to curiosity. Reindeer milk is very thick, and loaded with butyraceous principles. Its taste is somewhat sharp and biting and it can only be drunk in a diluted state. These animals make a strange noise with their knees. On coming near them, a series of cracking sounds are heard similar to those produced by an electric battery.

In summer their ordinary food is the Vaccinium already mentioned; in winter they live on a small white moss, extremely delicate, which they find beneath the snow by making a large hole with their fore-feet.

They often kill with a blow from the hoof a small rodent, the *Lemus Norvegicus*; not to feed upon its flesh, but to eat the grass which it has in its stomach. This shows a keen power of scent, and proves that necessity is the mother of invention. The Lemus resembles a water-rat.

To find the reindeer wild one must penetrate as far as Spitzbergen; that involves a six months' sail amongst the icebergs. Monsieur Ch. Rabot, well-known for his travels in Lapland, and a member of the Geographical Society, reported to the writer that he had himself killed twenty reindeer. While the seal is attracted by noise, the greatest silence is indispensable when hunting reindeer, and the windward side must be avoided. Frequently fishermen are seen arriving in little boats with some hundreds of these animals on board. These bold sailors brave innumerable dangers to catch the young white bears, which they sell to the different museums.

The grey bear is common. At Throndjem it is a constant dish at a restaurant; but tourists do not like it much on account of its highly flavoured taste.

The lynx and glutton are found. A Government reward of 35 francs is offered for the destroyal of either of these two.

Lastly, there is the *Cervus alces*, a stag larger than a horse.

We come now to the bird kingdom, creatures which exist in fantastic abundance in the arctic circle, and specially in the Lofoden isles.

After the splendour of the scenery, and the strange effects of the midnight sun, that which remains stamped upon the memory by a voyage along the Northern shores of Norway is the recollection of the myriads of winged creatures which form a cloud round the vessel.

You should see them on retiring for the night, battle for a place on a reef just peeping above the water.

You should hear them shrieking one to the other and making an indescribable uproar.

The Eider (*Anas mollissima*) is the most valuable. Its down, says Professor Guibourt, makes furs, muffs and coverlets as warm as they are light. This down constitutes a considerable source of revenue to the province of Finmark. The Dutch trade in the eggs. In Texel these are made into omelettes; and the southern part of that island is called Eyerland (or egg-land), on account of the number of birds which come there to lay their eggs. There is a sale for them at Amsterdam. Proper to Scandinavia are the *Tetrao urogallus*, and the *Laggopus mutus*.

If we pass the wonderful Lofoden islands, and continue the route towards the north, we arrive at Hammerfest, where we quit the birds for the fishes. As for the city itself, imagine a town watered by cod liver oil and you will have some notion of the odour. The captain had warned the party beforehand, but their handkerchiefs steeped in eau de Cologne were but a slight defence. This horrible smell is due both to the important manufacture of the oil and to the thousands of fish on hurdles drying in the sun.

The two to three thousand inhabitants of Hammerfest, the most northern town in the world (71° N.) are all occupied in this trade. Suffice it to say that a single boat well equipped, well stocked with bait, and in a good place can take from 500 to 600 cod a day. The scientific estimate that the ovary of a female of ordinary size contains nine million eggs.

This is the mode of preparation.

First they remove the head and abdominal viscera; the ovary serves for bait; the liver yields the oil. Not long ago the heads were wasted; now they are dried and powdered and used as manure for poor land.

The body, dried, hard and rolled in sticks, is called stockfish which is imported chiefly into Greece, Italy, France and Spain.

The fresh livers are piled in barrels, slightly pressed, and the virgin oil runs out, unfortunately a kind rare in pharmacy, though its quality is beyond doubt superior. Then the livers are treated by a press similar to those used in Normandy for cider.

This is oil, second quality; colour, reddish-brown.

The waste livers are subjected to strong heat, and an oil is produced, third quality and black.

Whales afford an industrial occupation at Hammerfest.

The day before the arrival of Monsieur Labonne, the fishermen had caught a whale without trouble. The creature had stuck in a small creek which made a sort of natural trap, and it was unable to regain the open sea. The captain was asked what might be the value of the fish; and he replied 6000 crowns (£336). They begin with selling rather dearly the 600 or 700 fins or whalebones; then they make great profit out of the immense quantity of fatty matters contained in the huge creature. This fat, improperly called oil, is naturally liquid and is used for dressing skins. Beside the oleine, margarine, and phoceine, there is a volatile principle of the odour of leather which gives the latter its characteristic smell.

Turning to quite a different train of ideas, there is a monument at Hammerfest erected to the memory of Struve, who measured an arc of meridian from Ismäil on the Danube to the frozen Ocean precisely at this spot.

Further north all cultivation disappears and tree vegetation ceases—nothing but an underwood of stunted birch and willow.

The weather, which had been superb, changed; the wind rose and a tempest broke over the travellers. Fortunately, the dense mist by which they were surrounded cleared, and some hours after they arrived in face of the old rock which marks Cape North. To their surprise the crevices were filled with vegetation. Mosses, dwarf arbutus, saxifrage, houseleek, yellow sedum, and other plants with which they were unacquainted, conveyed an idea of fertility.

Fish, even the largest, is caught with extreme ease; the large red hooks are scarcely plunged into the water than up comes an inhabitant of the sea, not a miserable specimen, but weighing some pounds at least.

Monsieur Labonne then mentions the famous hydromel, which is a syrupy alcoholic liquid made with water, honey and bitter herbs. Formerly it was the national drink of Sweden and Norway, but it has been dethroned by German beer. They tasted it, however, in a very small village near Upsal at Gamla-Upsala. Every visitor makes a point of so doing, and the liquor is served in the hollow ox-horn like that which served for a drinking vessel in the days of Thor, Odin and Freyr. But now they are mounted in silver, and the one offered to the tourist was a gift from Bernadotte to the innkeeper. A metal band bears the names of various princes and princesses who have imbibed the hydromel. The three gods, or rather deified kings, named are interred here, the tumuli being the sole curiosity of Gamla-Upsala. The village church is interesting as containing the tomb of Anders Celsius, the inventor of the centigrade thermometer employed in France. He was a Swede, but the Swedes themselves use the thermometer of Réaumur. A prophet has no honour in his own place.

The celebrated Tar is made in these parts from the wood of different kinds of pine: chiefly from *Pinus sylvestris* and *P. Ledebourii*.

The houses being constructed of wood, the trunks are reserved for that purpose; the roots and inferior portions being used for the tar manufacture. The process is as follows:—

As far as possible they select a barren spot on the mountain side and hollow out, funnel-wise, a big conical hole destined to receive the liquid product. Then just above this huge recipient they carefully pile up the roots and waste pine wood in a mound of about 25,000 cubic metres.

They cover this gigantic mass with a thick layer of turf and moss heaped up with heavy logs, and a few holes are left to let in air.

The fire is lighted from the top: the wood burns slowly, without flame, like forest charcoal kilns, and thus furnishes a large quantity of tar without detriment to the charcoal. This tar, following the slope of the mountain, accumulates in the reservoir, from which it is made to pass, by tubes arranged for the purpose, into iron tanks, or even into hollow trunks of trees. The operation lasts from one to five weeks, according to the way the roots, etc., have been prepared.

It is clear that those who are entitled to practise pharmacy enjoy much more consideration in those countries, where they are amenable directly to a central authority, than where, as in France, they are free after gaining a diploma.

But that which in Sweden chiefly raises their status is their union in societies analogous to the French Chamber of Notaries. An unworthy member may be excluded for a time or in perpetuity by the President after a meeting of the College. The limitation of number saves them from the necessity of gaining customers by all manner of reduced prices. The public are protected by a Government tariff, with fairly remunerative prices which cannot be exceeded.

The Swedes are not subjected to governmental visitation as in France, a matter which excites the indignation of Monsieur Labonne. He considers that the granting of a diploma should be accepted as sufficient guarantee for honourable conduct. Swedish pharmacy has, however, in his opinion, one grave inconvenience—the small number of pharmacies. These are transmitted from father to son; and from uncle to nephew. A number of well-educated young men, therefore, are forced to leave their native land, and to seek in France the means of subsistence, though they they possess a title which they have laboriously acquired.

MORPHINE.*

BY O. HESSE.

The author has studied the action of acetic and propionic anhydrides on morphine and its derivatives. With regard to the nomenclature introduced by Grimaux, the author contends that the term codeïne is unjustifiable. When the hydroxylic hydrogen in morphine is replaced by the acetyl group, the resulting product is mono- (or di-) *acetylmorphine*; and when it is similarly replaced by methyl, etc., the resulting compounds should be called *methylmorphine*, etc., and not codeïne, codethyline, etc. For derivatives where one of the hydrogen-atoms of the nucleus is replaced by methyl, etc., the author proposes the name of *morphimethine*, etc.

Morphine dissolves easily in excess of acetic anhydride at 85°, to form *diacetylmorphine*. This substance crystallizes in anhydrous prisms, which are easily soluble in alcohol, sparingly so in ether, melt at 169°, and with hydrochloric acid yield a hydrochloride which gives no coloration with ferric chloride. No more highly acetylized body could be obtained. *Dipropionylmorphine* was prepared in a similar manner. It is amorphous, easily soluble in alcohol, ether, and chloroform, sparingly so in water. The *hydrochloride* is an amorphous powder easily soluble in water and yielding a pale yellow amorphous *platinochloride* $[C_{17}H_{17}(C_3H_5O)_2NO_3]_2,H_2PtCl_6$. Morphine methiodide treated with freshly precipitated silver chloride yields *morphine methochloride* crystallizing in long colourless needles, containing $2H_2O$, which it loses at 120°. It dissolves in concentrated sulphuric acid without discoloration, but the solution turns violet when heated. It gives a dark blue coloration with ferric chloride in aqueous solution. The *platinochloride* forms orange needles containing 1 mol. H_2O. Morphine methiodide dissolves with difficulty in acetic anhydride at 100°–120°, and forms the diacetyl-compound. The yield is, however, very bad, a much more satisfactory result being obtained with morphine methochloride. *Diacetylmorphine methochloride* crystallizes in concentrically grouped needles, which are easily soluble in water, and give no coloration with ferric chloride. From its solutions potassium iodide precipitates *diacetylmorphine methiodide*. The chloride yields a pale yellow *platinochloride* crystallizing in small needles containing one mol. H_2O, which they partly lose on exposure to the air, completely at 110°. The action of methyl iodide on morphine in the presence of bases has already been studied by Grimaux (*Pharm. Journ.*, [3], xii., 48.) With acetic anhydride codeïne (methylmorphine) gives *acetylcodeïne* crystallizing from ether in prisms which melt at 133°. When propionic is substituted for acetic anhydride, *propionylcodeïne* (*propionylmethylmorphine*) is formed; on evaporating its ethereal solution, this is left as a colourless film easily soluble in ether, benzene, and alcohol. It dissolves in sulphuric acid with a bluish tint, which turns dark blue on the addition of a trace of ferric chloride. When heated, both solutions turn dark green. It yields crystallizable salts with acids. The *hydrochloride* crystallizes in large colourless needles containing $2H_2O$, and soluble in water and alcohol: it gives a yellow crystalline *platinochloride*. The *acetate* crystallizes in colourless needles soluble in water. It loses a part of its acetic acid at 100°. The *hydriodide* crystallizing with one mol. H_2O, the *oxalate* with $3H_2O$, and the sulphate are all soluble in water. *Codeïne methochloride* (*methylmorphine methochloride*) is obtained from codeïne methiodide by

* From *Annalen*, ccxxii., 203-234. Reprinted from the *Journal of the Chemical Society*.

treatment with silver chloride; and crystallizes in large rhombic prisms with one mol. H_2O. It yields a yellow flocculent *platinochloride* with $3H_2O$. The *sulphate* gives colourless needles containing $4H_2O$. A solution of the last-named salt yields, with barium hydroxide, a colourless solution of *codeïne methylhydroxide*, which on evaporation over sulphuric acid, deposits crystals of *methocodeïne* (*methylmorphimethine*). The unchanged hydroxide solution precipitates hydrates from solutions of metallic salts, and rapidly absorbs carbonic anhydride from the air. Codeïne methiodide dissolves in acetic anhydride at 85°, and deposits oblong rectangular tables of *acetylcodeïne methiodide* on cooling. Thus obtained, the crystals are anhydrous; but on recrystallization from alcohol, colourless needles containing $4H_2O$ are obtained. The *platinochloride* forms a yellow crystalline precipitate. If a solution of sodium, potassium, ammonium, barium, or calcium hydroxide be added to an aqueous solution of codeïne methiodide, a colourless strongly alkaline solution is obtained which gradually becomes coloured, and deposits *methocodeïne*. The reaction is quickened by using an excess of the alkali and heating to boiling. The action of the alkalies is therefore to liberate the hydroxide from which the elements of water are subsequently eliminated,

$$C_{18}H_{21}NO_3,CH_3(OH) = C_{19}H_{23}NO_3 + H_2O.$$

For the preparation on a large scale, it is best to boil the methiodide with rather more than the molecular weight of potassium hydroxide, extract the hot solution with benzene, and shake out the latter with acetic acid. The acetic solution is then saturated with sodium chloride, and the precipitated chloride recrystallized from a small quantity of water. A concentrated aqueous solution of the chloride is then decomposed with sodium hydroxide, and the base at once extracted with ether. In a few minutes the ethereal solution deposits long colourless prisms of methocodeïne. Freshly precipitated, this substance dissolves freely in ether, but when crystallized only sparingly. It crystallizes from boiling alcohol in prisms, from boiling water in needles, in the latter case with one mol. H_2O. It melts at 118·5°, and dissolved in 97 per cent. alcohol gives $[\alpha]_D = -208{\cdot}6°$ when $p=4$ and $t=15°$. In moderately concentrated sulphuric acid, the base and its salts dissolve to a colourless solution, which gradually becomes of a purplish-violet tint, and turns olive-green when heated. The base gives a blue colour when heated with concentrated sulphuric acid. The *hydrochloride* crystallizes with $2H_2O$ in needles soluble in 10·8 parts of water at 18°. The platinochloride is of a dark green colour.

Methocodeïne dissolves in acetic anhydride at 85°, and yields *acetylmethocodeïne*. It melts at 66°, and gives a blue coloration with concentrated sulphuric acid. It is soluble in alcohol, sparingly so in water. The salts crystallize easily: the *hydrochloride* with $\frac{1}{2}H_2O$, the *platinochloride* with $4H_2O$, the nitrate with $3H_2O$, and the sulphate with $8H_2O$.

With methyl iodide, methocodeïne forms *α-methocodeïne methiodide*, crystallizing in prisms with $\frac{1}{2}H_2O$ and soluble in water. The *α-methochloride* is obtained from the methiodide by the action of silver chloride, but could not be obtained in a crystalline form. It gives a blue colour with concentrated sulphuric acid. The *α-platinochloride* is a yellow flocculent precipitate. α-codeïne methochloride dissolves in acetic anhydride forming *α-acetylcodeïne methochloride*, which crystallizes with $2\frac{1}{2}H_2O$ in long colourless silkly needles, easily soluble in alcohol and boiling water, sparingly so in cold water. It gives up 2 mols. H_2O at 100°, but the remainder cannot be expelled without decomposition setting in. With concentrated sulphuric acid it gives a brownish-red coloration. The *platinochloride* forms a sparingly soluble yellow crystalline precipitate. An aqueous solution of the α-iodide becomes milky on addition of potassium or sodium hydroxide, and gradually deposits an oil which appears to be unchanged iodide. If, however, the solution be boiled with alkali, an oil is deposited on cooling, which solidifies after a time. This substance is not the original iodide, but is isomeric with it, and the author, therefore, names it *β-codeïne methiodide*. It differs from the α-iodide in crystalline form, in containing no water of crystallization, and in being less soluble in water. The *β-chloride* was not obtained in the crystalline form, and gave a purplish-violet colour with concentrated sulphuric acid. The *β-platinochloride* yields small orange needles: the sulphate is amorphous. Decomposed with barium hydroxide, the sulphate yields the alkaline *β-methocodeïne methylhydroxide*, which crystallizes in small colourless plates and flat prisms, soluble in water and alcohol. If the solution be evaporated at 30–40°, an amorphous deliquescent and highly caustic mass is left. This, however, is not a pure body. The *β-chloride* yields *β-acetyl-methocodeïne methochloride*, from which the β-iodide can be obtained by double decomposition. The *platinochloride* forms a yellow powder containing $3H_2O$.

These results confirm the presence of only two hydroxyl-groups in morphine; and the author points out that these two groups are different in character, the hydrogen of one being replaceable by either positive or negative radicals, that of the other only by the radicals of the fatty acids. Morphine methiodide is not decomposed by boiling with bases, whereas directly the hydroxylic hydrogen-atom is replaced by an alcohol radical, the stability of the methiodide is at once reduced, and in the presence of bases its decomposition and the introduction of the methyl radical into the nucleus takes place even at ordinary temperatures. The author believes the hydrogen-atom thus replaced to be one in close proximity to the hydroxyl-group which is only displaceable by acid radicals, and not, as Gerichten and Schrötter contend, one of those combined with the nitrogen-atom. He declines to accept as proved the formation of methylethylpropylamine by the decomposition of ethocodeïne methyl-hydroxide, on which Gerichten and Schrötter base their argument. On the latter supposition the author should have obtained dimethylpropylamine by the decomposition of methocodeine methyl-hydroxide, whereas he only obtained trimethylamine. He believes the decomposition to take place according to the equation —

$$C_{18}H_{20}NO_3(CH_3),CH_3OH = N(CH_3)_3 + C_{15}H_{10}O_2 + CH_3.OH + CH_2 + 2H_2O.$$

The ethyl compound would then give ethylene in the place of methylene, and this was observed by Gerichten and Schrötter, but ascribed by them to a secondary reaction.

The author is inclined to look upon *laudanine* as a morphine derivative containing propionyl, but in which the relative character and stability of the two hydroxyl-groups is different to what is the case in morphine. He is now continuing his researches in that direction.

OLIVE OIL AND ITS PRODUCTION.

The following particulars with regard to the production of olive oil in Tuscany have been furnished to Mr. Consul Inglis by one of the principal exporters in Leghorn:—

The olive oil produced in Tuscany from the first pressing of the fruit is intended for consumption as an article of food. Hence, great attention is paid both to the culture of the olive tree and the process of making oil.

The olive crop is subject to many vicissitudes, and is an uncertain one. It may be taken as a rule that a good crop does not occur more frequently than once in three years. A prolonged drought in summer may cause the greater part of the small fruit to fall off the trees. A warm and wet autumn will subject the fruit to the ravages of a maggot or worm, which eats its way into it. Fruit thus injured falls to the ground prematurely, and the oil made from it is of very bad quality, being nauseous in taste and somewhat thick and viscous. Frost

following immediately on a fall of snow or sleet, when the trees are still wet, will irretrievably damage the fruit, causing it to shrivel up and greatly diminishing the yield of oil, while the oil itself has a dark colour, and loses its delicate flavour.

The olive tree in Tuscany generally blossoms in April. By November the fruit has attained its full size, though not full maturity, and the olive harvest generally commences then. The fruit, generally speaking, is gathered as it falls to the ground, either from ripeness or in windy weather. In some districts, however, and when the crop is short, the practice is to strip the fruit from the trees early in the season. When there is a full crop the harvest lasts many months, and may not be finished till the end of May, as the fruit does not all ripen simultaneously. Oil made early in the season has a deeper colour, and is distinguished by a fruity flavour, with a certain degree of pungency; while as the season advances it becomes lighter in colour, thinner in body, and milder and sweeter in taste. Oil made towards the close of the harvest in April or May from extremely ripe fruit is of a very pale straw colour, mild and sweet to the taste, though sometimes, if the fruit has remained too long on the trees, it may be slightly rancid. Oil very light in colour is much prized in certain countries, notably France; and hence, if it also possesses good quality, commands a higher price in the Tuscan markets.

The fruit of the olive tree varies just as much in quality as does the grape, according to the species of the tree itself, the nature of the soil, exposure, and climate of the locality where it grows. Some varieties of the olive tree largely grown, because thought to be better suited to the special conditions of some districts, yield a fruit which imparts a bitter taste to the oil made from it; such oil, even when otherwise perfect, ranks as a second rate quality. The highest quality of oil can only be obtained when the fruit is perfectly and uniformly sound, well ripened, gathered as soon as it has dropped from the trees, and crushed immediately with great attention. Should the fruit remain any time on the ground, particularly during wet weather, it deteriorates fast and gets an earthy taste; while if allowed to remain an undue length of time in the garners it heats, begins to decompose, and will yield only bad oil.

The process of making oil is as follows:—The fruit is crushed in a stone mill, generally moved by water power; the pulp is then put into bags made of fibre, and a certain number of these bags, piled one upon another, are placed in a press, most frequently worked by hand; when pressure is applied, the oil flows down into a channel by which it is conveyed to a receptacle or tank. When oil ceases to flow, tepid water is poured upon the bags to carry off oil retained by the bags. The pulp is then removed from the bags, ground again in the mill, then replaced in the bags and pressed a second time. The water used in the process of making oil must be quite pure; the mill, press, bags, and vessels sweet and clean, as the least taint would ruin the quality of the oil produced. The oil which has collected in the tank or receptacle just mentioned is removed day by day, and the water also drained off, as oil would suffer in quality if left in contact with water; the water also, which necessarily contains some oil mingled with it, is sent to a deposit outside, and at some distance from the crushing house, which is called the "Inferno," where it is allowed to accumulate, and the oil which comes to the surface is skimmed off from time to time. It is fit only for manufacturing purposes. After the second pressing the olive-pulp is not yet done with; it is beaten up with water by mechanical agitators moved by water-power, and then the whole discharged into open-air tanks adjoining the crushing-house. There the crushed olive kernels sink to the bottom, are gathered up and sold for fuel, fetching about 12 francs per 1000 kilos., while the *débris* of the pulp is skimmed off the surface of the tank and again pressed in bags, yielding a considerable quantity of inferior oil, called "Olio lavato," or washed oil, which, if freshly made, is even used for food by the poorer classes. The pulp then remaining has still a further use. It is sold for treatment in factories by the sulphide of carbon process, and by this method yields from 7 to 9 per cent. of oil; of course suitable only for manufacturing purposes. Only the first two pressings yield oil which ranks as first quality, subject of course to the condition of the fruit being unexceptionable. New oil is allowed to rest awhile in order to get rid of sediment: it is then clarified by passing through clean cotton wool, when it is fit for use.

The highest quality of olive oil for eating purposes should not only be free from the least taint in taste or smell, but possessed of a delicate appetizing flavour. When so many favourable conditions are needed as to growth, maturity and soundness of the fruit, coupled with great attention during the process of oil-making, it is not to be wondered at that by no means all, or even the greater part of the oil produced in the most favoured districts of Tuscany, is of the highest quality. On the contrary, the bulk is inferior and defective. These defective oils are largely dealt in, both for home consumption and export, when price and not quality is the object.

In foreign countries there is always a market for inferior defective olive oil for cooking purposes, etc., provided the price be low. Price and not quality is the object, so much so that when olive oil is dear, cotton-seed, ground-nut and other oils are substituted, which bear the same relation to good olive oil that butterine and similar preparations do to real butter.

The very choicest qualities of pure olive oil are largely shipped from Leghorn to England along with the very lowest qualities, often also adulterated.

The oil put into Florence flasks is of the latter kind. Many years back this was not the case, but now it is a recognized fact that nothing but the lowest quality of oil is put into these flasks; oil utterly unfit for food, and so bad that it is a mystery to what use it is applied in England. Importers in England of oil in these flasks care nothing, however, about quality; cheapness is the only desideratum.

The best quality of Tuscan olive oil is imported in London in casks, bottled there, and bears the name of the importers alone on the label. There is no difficulty in procuring in England the best Tuscan oil, which nothing produced elsewhere can surpass; but consumers who wish to get, and are willingly to pay for the best article, must look to the name and reputation of the importers and the general excellence of all the articles they sell, which is the best guarantee they can have of quality.

THE RESIN INDUSTRY IN THE LANDES DEPARTMENT.*

BY A. RENARD.

The Landes department is the most important centre in France for the production of resin. This large triangular space of about fourteen thousand square metres, bounded upon one side by the ocean, and on the others by the Adour, the cultivated heights of the Lot et Garonne department, and the vineyards of Bordeaux, is an ancient bed of the sea, covered by sand of the Pliocene age. The sandy masses, which in many places are more than eighty metres thick, contain a few beds of clay; but at only a slight depth there occurs a compact layer, termed "alois," which is traversed with difficulty by the roots of trees, and which is one of the greatest obstacles to forest vegetation. In former times the rain-water, retained by this compact layer of sandstone, remained upon the soil, and transformed the surface of the Landes into a vast marsh; but since then numerous drainage ditches have been cut and convey the surplus water to the pools on the shore. In this way the surface has now

* From the *Moniteur Scientifique*, vol. xiii., p. 945.

become almost dry, the marshes have disappeared, and the inhabitants of these districts are no longer compelled to raise themselves on stilts to traverse the vast stretches of land, which formerly were impassable to ordinary pedestrians.

There is no doubt that before the middle ages the greater part of the Landes was covered with forest, at least upon the borders of the sea; but through the improvidence of the inhabitants these woods had been destroyed, and the sand had commenced its invading march from the sea coast, threatening to swallow all that it met upon its way. The first attempts which were made to reclaim the "dunes" date from the commencement of the eighteenth century; but it was Brémontier who, between 1787 and 1793, definitively solved the problem of the plantation of the Landes, he succeeding in consolidating more than 250 hectares of shifting "dunes." In the present day an immense forest of pines covers all this vast extent of territory, formerly uncultivated and marshy, and forms an impassable barrier to advance of the "dunes" from seaward.

The maritime pine is the tree chosen, to the exclusion of almost all others, by the Landais cultivators, and its reproduction is effected either from seeds or from cuttings; but the finest trees are those obtained from seeds, and this is the method generally followed. The sowing takes place naturally. Every four or five years a clearing is made by cutting down the least vigorous of the young trees so as to allow the others to develop under the most favourable conditions, and at the end of twenty-five or thirty years the trees are about one and a half or two metres apart. Those which at this stage still require to be removed are bled to death. This operation consists in making two large gashes on opposite sides of the tree, the turpentine that exudes being collected by one of the methods described subsequently. Under these conditions the tree is quickly exhausted, and at the end of four or five years is cut down. Eventually a final selection is made of the finest trees in the *pignada*, which are to be preserved for regular working, care being taken that they shall be equidistant at about eight metres; all the others are then bled to death and cut down at the end of from five to seven years. When the trees selected for preservation, which are called "*pins de place*," have attained a diameter of 30 to 35 centimetres they are ready for working.

By means of a sharp blade, slightly curved and fixed perpendicularly at the end of a wooden handle, an incision is made at the base of the tree on the side facing the east, and this is retouched every three or four months. The cutting is commenced in April and continued until the end of September, during which time it should reach a height of about half a metre. Care, however, is taken early in the season, about the beginning of March, to define the extent of the incision by removing the external surface of the bark from the part of the tree which is to be denuded. The following year the incision is continued upwards, and afterwards, for five consecutive years, until a height of two and a half or three metres is reached. A similar operation is then commenced on the side of the tree exposed towards the south, and by the time this has had its turn a return can be made to the first incision, which has become cicatrized. When the operation is well conducted a tree can be thus bled during more than two hundred consecutive years (*pendant plus de deux cents années consécutives*).

Two methods are in use to collect the exudation. The older one, which is the most simple, consists in making a small trench at the base of the tree, in which the runnings from the tree collect. While the incision is near the ground the collection is effected fairly well; but after two or three years, when the incision has attained a considerable length, the exudation reaches the ground with difficulty. Under the influence of wind and sun the greater part of the essential oil is volatilized or resinified, and the collection becomes insignificant. The second method called "Hughes's method," after its inventor, partially avoids these inconveniences, and, besides, has the advantage of yielding a "gemme" much more free from soil and vegetable *débris*. It consists in affixing to the tree, by means of a nail, a small pot, which is placed every year under the fresh cut. The turpentine thus caught, having to run a less distance to reach the recipient, is always richer in essential oil than that obtained according to the older method.

The collection of the "gemme" is made every two or three weeks. The pots are first emptied into a vessel of forty or fifty litres capacity, from which the contents are transferred to a large trench in the ground capable of holding four or five hundred litres, from which the casks are filled when required for sale. In October the resin that has solidified on the tree is gathered. This can be added to the other portion for the purpose of distillation, but usually it is kept separately, and sent into commerce under the name of "galipot" or "barasse."

The "gemme" is the primary material for the manufacture of oil of turpentine; it is a mixture, or rather a solution of colophony in the oil. Under the influence of heat the oil is volatilized and the colophony is left as a residue. The industrial distillation of the "gemme" is carried on in small factories usually situated in the midst of the forest. The season commences in the month of May and terminates in October.

On the arrival of the "gemme" at the factory it is decanted into two large wooden vats capable of containing one hundred barrels of 340 litres each. By means of a kind of saucepan fastened to the end of a long wooden staff the material is dipped from these vats and introduced into two large copper boilers, known as preparatory boilers, of six to eight barrels capacity. In these boilers the "gemme" is heated during a whole day over a low fire. The water collects at the bottom, whilst foreign substances, such as chips of wood, twigs, etc., rise to the surface, from whence they are skimmed off and put to drain in straw filters arranged above the second boiler. In the evening the fire is allowed to go down and the boiler is left to itself. In the morning the "gemme," freed in this way from the water that it held in suspension and which frequently amounts to 12 or 15 per cent., as well as earthy and ligneous matters, is introduced into a copper receiver of a fixed capacity of 300 litres. At the bottom of this pan there is a pipe, fitted with a tap, the other end of which opens at about eight inches from the bottom of the still in which the distillation has to be effected. The still is of copper and furnished with a worm that dips into a wooden receiver full of water. Three hundred litres of "gemme" are run in and heated strongly. The oil commences to distil over and at the end of fifteen or twenty minutes about eighty or a hundred litres of hot water are run into the still through a tap fixed in the upper part of it. This addition of water has for its object to facilitate the volatilization of the remainder of the essential oil. The distillate is received in a vessel made of sheet-iron and fitted at its upper part with a capacious pipe, by which the essential oil, being lighter than water, passes off into the casks set for its collction.

When the liquid issuing from the worm no longer contains much essential oil, the supply of water is stopped; the distillation is then continued for a few minutes more and the operation is finished. The yield of essential oil varies with the season and is about 15 to 18 per cent. of the weight of the "gemme." The exit pipe at the bottom of the still is then opened and the "brai," or resinous residue, is run into a sheet-iron tank, after having been made to pass over a copper plate pierced with holes, so as to eliminate various impurities that it may contain. The apparatus is then ready for a fresh operation, which is commenced without allowing it to get cold. In this way eight or ten distillations are effected daily.

After the "brai" has been allowed to cool for some time it is run into wooden casks, where it solidifies. That which is derived from "gemme" collected by Hughes's

method is sent into commerce under the name of "yellow colophony" and that obtained from "gemme" collected by the old method is sold under the name of "brai clair." The resins of inferior quality, or "brais noirs," are obtained by the same method, but are the product of the distillation of the less pure portion of the "gemme" which collects towards the bottom of the preparatory boilers.

Sometimes the "brai," instead of being run directly into casks, is used for the manufacture of resin. In this case, upon issuing from the boiler of the still, it is run into a special vat, and whilst it is still liquid about 15 to 20 per cent. of hot water is added, in quantities of 20 to 30 litres at a time. The mixture is stirred energetically with staves until the whole mass has become opaque and thoroughly homogeneous; then it is run through a trough in sand into cylindrico-conical moulds also in sand, where it solidifies. The resin thus obtained is of a pale yellow shade, and under the name of "yellow resin" or "*résine de boutique*," is used in the making of resin candles.

The straw filters, upon which have been deposited all the impurities collected upon the surface of the preparatory boilers, are used for the preparation of a further quantity of "gemme" of inferior quality. They are introduced together with the detritus remaining upon them into a kiln, resembling a lime-kiln, known as a "*four à pègle*." The fire being lighted and a portion of the material burnt, determines the liquefaction of the "gemme," which runs off through an orifice situated in the lower part of the kiln into a receiver containing water. This "gemme," submitted to distillation, yields about 10 per cent. of its weight of essential oil.

Manufacture of Resin Oils.

This industry dates back half a century, and at the present time has attained a considerable development. In 1832, M. Dives, whilst distilling "gemme" for the extraction of oil of turpentine, made the observation accidentally that in continuing the operation beyond the point when only colophony was left in the still this was decomposed, giving rise to an oil. He therefore replaced the copper alembics by cast iron retorts, and the mode of distillation which he adopted is the same as is employed at the present time.

Eighteen hundred kilograms of "brai" are introduced into a large hemispherical cast iron boiler, heated over arches, together with 1½ or 2 per cent. of lime, added with the object of rendering the oils more fluid. The boiler is covered with a copper dome, which is luted with clay; this is in communication with a worm, also in copper, disposed in a vat full of cold water. Pine wood is employed as fuel in heating the boilers. The operation is commenced at three o'clock in the morning, the fire being urged strongly at the commencement, and in two or three hours the distillation begins; the fire is then moderated and maintained so until seven in the evening. The distilled products are received in a small sheet iron vessel, having in its upper part a tube by which they can be passed into the casks. At the commencement of the operation water passes over, which is run off through a tap placed in the lower part of the receiver. Afterwards about 25 kilograms of a light fraction are collected, and then nine or ten barrels of oil, each containing 160 kilograms. At the end of the operation the bottom of the boiler is brought to a dull red heat. There remains then only a solid carbonaceous residue, which has to be removed by means of a pick after each distillation.

The total yield in the lighter fraction and resin oils is about 80 to 85 per cent.; the principal loss is due to the combustible gases which are given off in abundance during the whole of the operation, and which have not hitherto been utilized.

The resin oils thus obtained are not identical throughout the entire distillation. They are distributed generally, according to their colour, into three classes: pale oils, blue oils and green oils.

The "pale oils" are the most abundant, the quantity reaching 1100 or 1200 kilograms in each operation. They are of a brownish yellow colour and rather fluid. In density they vary between 0·990 and 1·000. They are incongelable, even at very low temperatures. They possess considerable lubricating properties, but present the inconvenience of resinifying rather rapidly in contact with the air, which, together with their odour, has always limited their employment. Railway companies and miners use large quanties for lubricating machinery, after adding 25 to 50 per cent. of colza or mineral oil. They are also employed, either alone or mixed with linseed oil, in the manufacture of printing ink.

The "blue oils" consist of that portion of the products which passes over immediately after the pale oil. These oils are more coloured and have a very pronounced blue fluorescence. Their density is about ·990 to 1·000.

Lastly, when the operation approaches its termination, the 'green oils" are collected, which are of a still darker shade, and possess a very strong green fluorescence. They are always mixed with a very large proportion of water, from which it is extremely difficult to free them. These oils, like the "blue oils," are more fluid than the "pale oils;" they contain, in fact, a larger proportion of a light spirit, the presence of which is due to the commencement of pyrogenation which the colophony undergoes in consequence of the high temperature to which the distillatory apparatus is submitted.

The blue and the green oils are employed especially as lubricants for waggons used in mines. As to the light spirit the proportion of which amounts to one or two per cent. of the colophony distilled, its employment is very limited. It possesses a very pronounced odour, is brownish in colour, and has a density of about 0·950. Exposed to the action of the air it resinifies rather rapidly, similarly to oil of turpentine. Occasionally it is used in the place of oil of turpentine, especially in making up paint for out-door use.

The resin oils, obtained by the method indicated, are usually sent into commerce in the same condition. They are then frequently turbid and slightly opalescent through the presence of a small quantity of water distributed through the mass. In order to render them limpid, M. Durou has proposed to allow them to stand some time in large reservoirs arranged under glass roofing, exposed to the sun. Under the influence of heat and light the oil clarifies pretty rapidly, especially in summer, and at the same time undergoes a slight decoloration. The same result is also attained by a rectification, and for this purpose the apparatus used in the distillation of the colophony is employed. The operation should be conducted slowly. A certain quantity of light spirit is first collected and set aside, after which, the oil distils perfectly clear. This distillation yields very good results; but always occasions a loss of 6 to 8 per cent. The rectified oil has a density of ·972. Several processes have been proposed for removing from resin oils their odour, which in many cases constitutes an obstacle to their employment. Washing with soda, followed by agitation with sulphuric acid, is the process which appears to yield the best results, but this method of purification has not yet received any industrial application.

When a lubricant for carriages is required the "brai" is submitted to a rapid distillation not lasting more than four hours. The oil obtained under these conditions then contains a large proportion of resin, which has been carried over mechanically; it is viscous and thick, and is known as "strong" oil. To prepare the lubricant, one part of slaked lime is suspended in two parts of thin oil from a slow distillation, and one part of the thick paste so obtained is incorporated with four or five parts of "strong" oil. The resin contained in the latter combines with the lime to form a resinate of lime. The paste is stirred well, and then while still liquid it is run into barrels or boxes, where it acquires quickly the desired consistency. These lubricants are sometimes coloured by the addition of powdered pigments.

The Pharmaceutical Journal.

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INDIAN PHARMACOGNOSY.

AT a time when utilitarian ideas exercise so dominating an influence as they do in the present day it may savour somewhat of the Quixotic to appear to advocate the extension of technical studies to antiquarian researches respecting drugs, since these do not, superficially at least, suggest yielding much of a *quid pro quo* in pocket or reputation. Many pharmacists are already disposed—and with good reason—to complain of the little value set by the public on qualifications obtained at the cost of hard labour and hard cash in order to enable them to serve it more efficiently. Certainly there is little in this direction to encourage the pharmaceutical student to stray beyond those bounds in the science of materia medica which enclose what is absolutely requisite in order that he may be able to pass his examinations and carry on his calling creditably. Yet there have always been a few who have interested themselves in points turning upon the history as well as the sources of drugs, and have been able to appreciate a work like 'Pharmacographia,' or a series of articles like the "Notes on Indian Drugs," from the pen of Dr. DYMOCK, which were published in this Journal a year or two since and were highly prized in many quarters, though they did not escape a somewhat irrational protest at home. It may interest some, therefore, to learn that the republication of the "Notes" by Dr. DYMOCK, systematically arranged and in a collected form, has been the occasion of the appearance of an appreciative article on Indian Pharmacognosy in the *Archiv der Pharmacie*, in which Professor FLÜCKIGER, who has himself made such important contributions to this class of literature, recalls some interesting facts in the antiquities of Indian drugs.

As late as the commencement of the sixteenth century very little comparatively was known in Europe respecting India. Although the importation of its products in the middle ages depended mainly upon the enterprise of the great commercial republics of Italy, even the most powerful of them had no direct and regular intercourse with India, and only occasional travellers from one or another of them reached the famous land. The notices of its drugs in those times were therefore few and widely separated. In the sixth century, KORMAS, a Greek merchant and traveller, saw the pepper plant growing in its South Indian home and met there also sandal wood and cloves brought from the more remote east. In the ninth century, KURDADBAH, postmaster and minister of police to the caliphs of Mesopotamia, obtained certain information respecting camphor, cubebs, galanga, and pepper. A century later mention was again made of pepper by the Persian geographer ISTACHRI, and in the twelfth century the first mention was made of cardamoms as an Indian drug by IDBISI, the Arabian geographer at the court of the Norman King ROGER, at Palermo. The earliest information respecting Ceylon cinnamon dates from the thirteenth century. The fourteenth century saw members of different religious orders making their way into the peninsula, and from them came notices of ginger, and more information upon cinnamon and the important subject of pepper. But in the first half of the fifteenth century a Venetian merchant, NICCOLO DE CONTI, spent twenty-five years in India, and in his exhaustive and striking accounts of the spices and dyeing materials of Southern India went far beyond his predecessors, and may be said to have opened up a new era.

In 1497, just as the Spaniards were invading a new world in the west, the doubling of the Cape of Good Hope by the Portuguese discoverer, VASCO DA GAMA, opened up a sea route to the East Indies, a feat which his countrymen were not slow to turn to advantage in establishing an important commerce. Amongst the officials sent over to look after the interests of Portugal was THOMAS PIRES, an apothecary, who was first appointed to the "factory" in Malacca, partially apparently in the interests of pharmacy, and afterwards was sent as an ambassador from Portugal to China. Writing from Cochin, in 1516, to King MANUEL, he enumerates the drugs indigenous in the country, as well as those imported. The information contributed by this Portuguese pharmacist, though still too scanty, was an advance on what was known before. According to him frankincense came to Cochin from Arabia, as well as from Orissa, on the east coast of India, though what this latter frankincense was exactly is not now quite certain. Opium was imported from Egypt through Aden; but it was also already produced in Cambaya, north of Bengal, and Bombay. The drug was then only "eaten" (probably smoked) by kings and lords, on account of the cost. Tamarinds, on the other hand, were so cheap, as to be looked upon as a "vergelt's Gott." PIRES also met there with aloes from Socotra, Aden, Cambaya, Valencia in Aragon and Sumatra. Among the "gomas fetidas" he enumerated sagapenum, galbanum and opopanax; but neither ammoniacum nor asafœtida. He also mentioned myrrh and liquid styrax. From the mineral kingdom, which was at that time well represented in pharmacy, PIRES met with "tincar" (tincal) from Thibet and "rubine," as well as pearls from the Red Sea, Ceylon and Southern China. About the same time, another Portuguese, ODOARDO

Barbosa, wrote an account of a journey through India, in which he quoted the prices of a series of drugs that he met with in Calicut, on the Malabar coast. But a much more valuable contribution to the history of Indian drugs was made by a third Portuguese, Garcia de Orta, who in 1534 went out as physician on board an admiral's vessel and settled down at Goa as royal physician to the hospital. There he produced his famous 'Coloquios dos Simples e Drogas,' in which Indian drugs were described with a care previously unknown, the descriptions being accompanied by a mass of other useful information. Next to that of Garcia the name most worthy of mention in connection with the history of drugs in the sixteenth century is Filippo Sassetti, who writing to a friend in his native state of Florence, probably from Cochin, discoursed right intelligently of the catechu tree (*Acacia Catechu*) and Ceylon cinnamon bark. In the next century the Dutch became powerful competitors with the Portuguese for the commerce of these regions, and wrested from them successively the famous Spice Islands, or Moluccas, and Cochin. Some knowledge of the natural products of the neighbouring countries must therefore have become a desideratum to the new masters, and it was in these circumstances that Hendrick Adriaan Rheede tot Drakenstein, the Dutch governor of the Malabar coast, ordered the compilation of the 'Hortus Indicus Malabaricus,' which was not published, however until 1703, four years after his death. In this work, which consisted of twelve folio volumes and was illustrated by seven hundred and fifty plates, many of the medicinal plants of Southern India were figured and described. Another contribution to this field of literature from Holland was Burman's 'Thesaurus Zeylanicus.' After the British rule had become definitely established in India, especially by the memorable battle of Plassey, in 1757, the ground was taken up by investigators from our own country, Dr. William Roxburgh being in the front rank. In his 'Plants of the Coast of Coromandel,' published in the years from 1795 to 1819, and his 'Flora Indica,' published between 1820 and 1832, not a few plants of pharmaceutical or technical interest were figured and satisfactorily described for the first time. In 1813 another English physician, Dr. W. Ainslie, in his 'Materia Medica of Hindostan' called attention exhaustively to the popular remedies of India, a subject which had been partially dealt with three years before by Fleming in a 'Catalogue of Indian Medicinal Plants and Drugs.' Then followed a number of valuable botanical works, in which, however, pharmacognosy had no special place; among these may be mentioned Wallich's 'Plantæ Asiaticæ Rariores,' Wight's inclusive but artistically unimportant 'Illustrations of Indian Botany' and 'Icones Plantarum Indiæ Orientalis,' and Royle's 'Illustrations of the Botany and other Branches of Natural History of the Himalayan Mountains and of the Flora of Cashmere.' In 1837 this last-mentioned author, who was a medical man in the service of the East India Company, broke fresh ground in the still imperfectly worked field of Indian medicine and published an essay on 'The Antiquity of Hindoo Medicine,' a line that has been followed in more recent years in Udo Chand Dutt's 'Materia Medica of the Hindoos.' In 1842 a new phase in the literature of Indian materia medica was initiated by the issue in Calcutta, by the order of the Government, of O'Shaughnessy's 'Bengal Dispensatory,' which was but the forerunner of the 'Pharmacopœia of India,' a work prepared under the authority of Her Majesty's Secretary of State by Dr. Waring, assisted by a Committee of native and English experts, amongst whom was the late Daniel Hanbury. We have thus followed Professor Flückiger through his *résumé*, dating from the earlier notices of separate Indian drugs to a period when they were first officially catalogued and described in a national pharmacopœia. Here we must leave him, notwithstanding that a flattering mention of the place which this Journal has taken in this field of literature might have excused our pursuing the subject a little further.

There seems to be every probability that the Annual Dinner on Wednesday next, at the Holborn Restaurant, will in every respect prove to be a success equal to any of its predecessors. At the risk, therefore, of appearing to be guilty of unnecessary repetition we would urge those members and friends who desire to be present, if they have not already obtained their tickets, to apply for them to-day (Saturday) to the Honorary Secretary, Mr. Richard Bremridge, as it will be absolutely necessary to close the list in time to allow proper arrangements to be made. On Wednesday evening, as probably most of our readers are aware, the Conversazione will be held in the South Kensington Museum.

* * *

We have received a copy of the Report of the Executive Committee of the Chemists and Druggists' Trade Association which will be presented at the Annual Meeting of the members, to be held at the Inns of Court Hotel, Lincoln's Inn Fields, on Tuesday next, at noon. It commences with an enumeration of three cases in which members have been successfully defended in prosecutions under the Sale of Food and Drugs Act, and four cases in which proceedings have been taken for infringements of the Pharmacy Act. It then refers to the communications of the Executive with the Council of the Pharmaceutical Society in reference to the amendment of the Pharmacy Acts, and describes the course taken in petitioning Parliament for the amendment of the Medical Bill so as to provide for the representation of pharmacists on the Pharmacopœia Committee. The other work mentioned as having been done during the year is the obtaining of the issue of an Order by the Inland Revenue authorities that officers when purchasing methylated spirit for analysis shall

leave a portion of the spirit sold with the seller. It is to be regretted that the Executive has again to report a decline in the strength of the Association, whilst even of the 3340 members said to be at present on the Register only 2632 appear to have paid the annual subscription. Whether this state of affairs, which has involved a further diminution of the balance in hand, is correctly attributed in the Report to "the severe and now long continued depression in trade," is in our opinion at least doubtful. We think it is rather attributable to an apathy, similar in quality, but intensified in degree, to that which has before now laid the Pharmaceutical Society, with double the number of subscribers, under the reproach of not being representative of the whole body of chemists and druggists.

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France, and, indeed, the whole scientific world, has sustained another most serious loss through the death, on Monday last, of Charles Adolphe Wurtz, the eminent chemist. Barely a month has passed since, as the representative of the Faculty of Sciences and the Faculty of Medicine of Paris, he took part in the obsequies of his illustrious master, Dumas, and now he has himself been called away. Some words which he used on that occasion seem peculiarly applicable to the circumstances of his own death. "Une belle mort: elle vous a surpris au mileu des vôtres, dans le plenitude de vos facultés." It is rather remarkable that of the four eminent men who have yet delivered the Faraday lecture, two should have died within a few weeks of each other. We hope to be able to give next week some account of the life and work of M. Wurtz, who was an Honorary Member of the Pharmaceutical Society of Great Britain.

* * *

England, too, about the same hour lost one of her ablest chemists in Dr. Robert Angus Smith, who died at Colwyn Bay, in his sixty-eighth year. Dr. Smith was born in Glasgow, where also he received his early education; but he studied chemistry under Liebig, at Giessen, and more than thirty years afterwards he bore testimony, in the dedication of his most characteristic work, 'Air and Rain,' to the admiration he still retained for his great German master. His name, as a scientific man, is most closely associated with researches upon the atmosphere and its pollution by noxious gases. Upon the passing of the first Alkali Act, in 1873, he was appointed Inspector-General under its provisions, and the annual reports issued under his superintendence have evidenced the skill and tact that he brought to bear in enforcing the new, and in many quarters much disliked law.

* * *

In a review of the drug trade of New York for the year 1883, Mr. D. C. Robbins states that among the most noteworthy facts were the large increase in the importation of quinine salts and the decrease in the importation of cinchona bark for manufacturing purposes. During the year the imports of quinine salts amounted to 1,055,764 ounces, against 794,495 ounces in the previous year; whilst the imports of bark fell from 5,010,547 pounds in 1882 to 3,639,315 pounds last year. The imports of medicinal opium appear to have remained nearly stationary; but the increase in the quantity of opium specially manufactured for smoking purposes was enormous. Hitherto this opium has been imported *viâ* San Francisco, and it has been assumed that it has been consumed principally by Chinese residents; but Mr. Robbins points out that the import of smoking opium, which, previous to 1882 had never exceeded 77,196 pounds, in that year reached 106,221 pounds, and in 1883 amounted to 298,153 pounds, whilst during the same time there has been but little increase in the Chinese population in the United States.

* * *

Some idea of the extent to which the competition of the coal-tar colours continues to affect natural pigments may be gathered from the fact that the cochineal harvest in Teneriffe, which so recently as the year 1880 was estimated to produce to the farmers £600,000, is estimated to have yielded last year only £200,000, the average price having fallen from 2*s.* to 9½*d.* per pound. There also appears to be some additional anxiety in the island in respect to the future of the cactus upon which the insects are reared, and rhea grass and the sunflower have been suggested as substitutes.

* * *

In accordance with a resolution passed at the last annual meeting of the German Pharmaceutical Association, the Council of that society has nominated a "Permanent Pharmacopœia Committee," consisting of the following twenty members:—F. A. Flückiger, B. Hirsch, G. Biltz, G. Vulpius, C. Schacht, A. Kohligk, C. Brunnengräber, C. Schneider, G. Berg, G. Wolfrum, T. Salzer, C. Finkh, —Bertkau, T. Pusch, T. Wimmel, A. Oberdörffer, C. Bernbeck, O. Maschke, B. Jassory, and T. Dugend.

* * *

The Lord Chancellor has intimated his intention of adding the name of Mr. Richard Fitzhugh, Pharmaceutical Chemist, to the Commission of the Peace for the Borough of Nottingham. Mr. Fitzhugh was for several years, and until recently, a Local Secretary of the Pharmaceutical Society and Superintendent of Written Examinations, and we doubt not that many of our readers will learn with pleasure that this honour has been conferred upon him.

* * *

The Summary in the 'Medical Students' Register' for 1883, which has just been issued, shows that the total number of medical students registered last year in the three kingdoms was 1783, being 79 less than in 1882, and a lower number than has been registered since 1878. The falling off was considerable in England and Ireland, whilst in Scotland there was an excess of registrations over those in any previous year.

* * *

We have been favoured with a copy of the "Order of Exercises," which was to have been followed at the Annual Commencement of the Massachusetts College of Pharmacy, held on the 2nd inst., and notice that one of the addresses was to be delivered by Mr. Henry Sugden Evans, a former President of the Pharmaceutical Society of Great Britain.

* * *

Among the candidates selected by the Council of the Royal Society to be recommended for election at the annual meeting are—Professor G. J. Allman, Professor J. Bayley Balfour, Mr. James Bell, Professor Walter Noel Hartley, Professor J. G. McKendrick, Dr. A. Ransome, Professor C. S. Roy, and Professor M. Watson.

Provincial Transactions.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

The last meeting of the session was held at the Owens College, on April 29. Mr. F. R. Cooper, in the chair. The minutes of the previous meeting having been read and confirmed,

A lecture with experiments was given on the "Manufacture of Coal Gas," by Messrs. A. W. Duncan, F.C.S., and F. C. J. Bird, conjointly, the latter exhibiting with the lantern a series of thirty views and diagrams.

Mr. Duncan, after briefly describing the origin and formation of coal, said that the coal is carbonized in fire-clay retorts, at a temperature of 1800° or 2000° F.; the higher the temperature the greater is the volume of the gas, but with a smaller illuminating power for the same quantity consumed; the total illuminating effect of the whole of the gas produced, however, shows a gain. The coal is carbonized for from four to six hours, when the coke is withdrawn and the retorts recharged. The retorts are continually in operation, never being allowed to cool down for a period of twelve or eighteen months, when they are worn out and require renewal. The gas next bubbles through the liquid in the hydraulic main, which acts as a seal or liquid valve, preventing the backward rush of the gas when the retorts are opened. Here tar and ammoniacal liquor deposit from the cooling gas; the ammonia exists as hydrate, sulphocyanide, hyposulphite, carbonate and sulphide. In the condensers, through which the gas is next passed, the gas is thoroughly cooled, when more tar and ammoniacal liquor is deposited. Care has to be exercised, especially in the winter time, not to cool too much, or the gas would suffer deterioration by the condensation of some of its illuminating constituents. It is necessary to prevent pressure in the retorts and overcome the resistance of the several purifying arrangements and the weight of the gasometers. For this purpose there are several fan arrangements, called exhausters, for forcing the gas in the proper direction. In the early days of gas lighting, before exhausters were used, the gas was much deteriorated by the pressure, some of the hydrocarbons being decomposed and depositing dense gas-carbon around the interior of the retorts. The gas is next thoroughly freed from ammonia, which has only partially been left in the condensers and hydraulic-main; not only is the ammonia a valuable bye-product, but if left in the gas it would corrode the copper and brass fittings of the meters, etc. For the removal of the ammonia are a great variety of apparatus termed scrubbers, washers and washer-scrubbers. The best known is the coke-scrubber, being a tower filled with coke; a spray of water is distributed over the top, which slowly percolating through the coke exposes a large moist surface to the ascending gas, and thus the ammonia is absorbed. The Livesey scrubber is a very efficient one; in this the coke is replaced by a large number of grids or trays about four inches apart, each tray is formed of deal boards about half an inch thick, with the same distance between each board. In the washers there are various arrangements by which the gas is made to bubble through water. The gas still contains some sulphur compounds and carbonic acid, and to free it from these it has to pass through rectangular boxes called purifiers. There are two modes of purification, one with hydrate of lime and the other with hydrated oxide of iron. Hydrate of lime removes carbonic acid and sulphuretted hydrogen, and the sulphide of calcium produced combines with and removes the bisulphide of carbon. Oxide of iron purification gives no objectionable smell of sulphuretted hydrogen, as does the spent lime, which latter is difficult to dispose of, except from the smaller works in agricultural districts where it can he utilized as a fertilizer. The hydrated oxide of iron, however, only combines with the sulphuretted hydrogen, allowing the carbonic acid and carbon bisulphide to pass. When all the iron has been converted into sulphide, it only needs exposure to the air to be revivified; the iron is oxidized and the sulphur deposited. The oxide is repeatedly used until it contains a large amount of sulphur, when it is sold to be converted into sulphuric acid. The purified gas only requires to pass through the meter to be registered before passing into the gasometer. In the Cooper process, lime is placed in the retorts with the coal, and in this way much of the sulphur, instead of passing into the gas and needing so much purification, is left behind in the retorts in combination with the lime. The process, however, when tried in Salford, was found to deteriorate the coke so much as to prevent its adoption. One of the most promising of recent inventions in gas lighting is that of the regenerative furnace of Siemens; a bench of these are in use at the Salford Gas Works with very satisfactory results, there being a great saving of coke. By the ordinary arrangement the retorts are not heated by the direct flame but by the heated air and products of combustion. The fire has to be kept at a much higher temperature than that to which the retorts are heated, as by the time the heated air has reached the furthest retorts it has been very much cooled down. The retorts are not uniformly heated;—whilst those nearest the fire may be overheated, those furthest away are insufficiently. In the regenerative furnace, we have first the generator where air in insufficient quantity for complete combustion is passed over ignited coke; there is thus formed highly heated carbonic oxide, with some hydrocarbons; also hydrogen and oxygen from the decomposition of steam which is allowed to pass through the ignited coke. These gases pass directly under the retorts, where they are mixed with a sufficient quantity of air for their complete combustion; this air being first highly heated by the waste heat of the furnaces. This gaseous fuel can, unlike coke, be brought just where it is required and the retorts are exposed to the direct flame. By the ordinary method, under the most favourable conditions, at least double the volume of air theoretically necessary for complete combustion has to be admitted into the furnaces, thus causing a great loss of heat. In the Siemens furnace, however, the air can be much better regulated, and the quantity required is much nearer the theoretical quantity.

After the reading of the paper a discussion took place and hearty votes of thanks were accorded the authors for their paper.

The Chairman having congratulated the Association on the successful proceedings of the past session, the meeting then terminated.

MANCHESTER PHARMACY STUDENTS' ASSOCIATION.

On Saturday afternoon, May 3 (by the kind permission of the manager, Mr. Hunter), a visit was paid by members of this Association to the Salford Corporation Gas Works, at Regent Road. The party were conducted through the works, and the process of gas-making in its various stages lucidly explained by Mr. Spencer, special attention being called to an experimental retort bench now on trial at these works, in which the retorts are heated on the regenerative system, and which is said to promise most satisfactory results. At the close of the inspection a hearty vote of thanks was passed to Messrs. Hunter and Spencer.

The monthly meeting took place on Thursday evening, May 8, in the Materia Medica Museum, Owens College (by permission of the Council). The President, Mr. A. H. Jackson, B.Sc., in the chair.

Before opening the meeting the President, in a few well-chosen sentences, expressed his sincere pleasure at seeing so many members present, at the same time re-

marking that the Owens College was the home of many societies which, though much smaller in numbers than they were, yet did good and useful work; he also trusted that youth and energy might do much for the Asscciation, and wished it a long and vigorous existence which might enable it to contribute to the mutual advantage of its members, to their pharmaceutical knowledge, and to the elevation and advancement of the cause of pharmacy.

The President then called upon Mr. William Kirkby to read a paper on "An Adulteration of Quince Seed."

After describing the botanical origin, microscopical structure, etc., of the quince seed, which were illustrated by diagrams and coloured plates, the author drew attention to a sample of quince seed which had undoubtedly been exhausted of the mucilage contained in its outer coats, dried, mixed with particles of some gum (probably acacia or senegal) to give its decoction the necessary viscosity, and then offered for sale. The seeds at first sight were not very dissimilar in appearance to ordinary quince seed, but from experiments made by the writer (details of which were given) they yielded, on treatment with water, a very weak and inferior mucilage.

After the reading of the paper a discussion followed, in which the President, Messrs. Thomas, Mitchell, Breeze, Elborne, and the Secretary took part.

The second paper of the evening, on "The Aconites," was then read by Mr. William Elborne.

Dividing the aconite roots of commerce into three groups, European, Indian, and Japanese, allusion was made to the distinguishing characters of the roots obtained from the various species, and their structure and chemical composition fully entered into. Reference was especially made to the microscopical distinctions between the roots of the European species, *A. Napellus*, *A. variegatum*, and *A. paniculatum*, their transverse sections showing a totally different arrangement of the vascular bundles. The paper was well illustrated by specimens and microscopical sections.

A discussion on the subject was then carried on by the President, Messrs. Duncan, Kirkby, and Breeze.

The next meeting will be held on Thursday evening, May 22, when a paper will be read on "The Poisons Act—Is Legislation Necessary?" by Mr. A. D. Breeze.

On Saturday afternoon, May 24, a visit will be made to the Botanical Gardens, Old Trafford, when Mr. William Elborne will read a paper on "The Medicinal Plants of the Month."

LEICESTER CHEMISTS' ASSOCIATION.

A lecture was delivered at the rooms of the above Association, on Wednesday evening, by Mr. H. Pickering, on "Induced Electricity."

Mr. J. J. Edwards presided, and there was a very good attendance.

The lecturer explained the various phenomena of inductive electricity in a very able manner, illustrating the different properties by means of a powerful battery, a large Ruhmkorff's coil, and numerous other electrical instruments.

The lecture was thoroughly enjoyed by those present, and at the close a hearty vote of thanks was accorded to Mr. Pickering.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, May 1, Mr. T. S. Dymond, Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed, a paper on "Animals or Plants?" by Mr. C. Shapley, was read by the Assistant Secretary.

The author first called attention to the fact that the distinctions between animals and vegetables are not in all cases so evident as might at first sight be supposed, but that, especially in the lower forms of life, a good deal of research is often necessary to establish which division certain organisms belong to, and that even then, what is considered an animal to-day may be classed as a plant to-morrow.

The principal distinctions between plants and animals were enumerated in order, and it was shown that each in turn did not hold good in all cases, and that although all of them applied in the majority of cases, yet none was perfectly absolute. Examples were given in each case of exceptions to these rules; the composition of the cell-wall (cellulose in plants, gelatine in animals) was stated to have an exception in the case of the cloak of the lower molluscs, which contained no nitrogen; the presence of starch in some animal tissues, and of chlorophyll in stentor, hydra, etc., as well as of cholesterin in certain plants, was mentioned; certain plants (protophytes) were stated to have organs of motion similar in character and constitution to those of certain animals (protozoa); and the power possessed by certain animals, *e.g.*, fresh water sponge, of decomposing CO_2 and developing chlorophyll in the presence of light was noticed. The most trustworthy distinction was shown to be that animals derive their nourishment from organic substances which they receive into their interior, while plants live on inorganic material, absorbing it from without. This was shown to hold good in nearly all cases, the few exceptions, such as euglena having been observed in the substance of a diatom, being considered doubtful. A supposed instance of metamorphosis in the case of *Volvox Globator* was referred to, and the life history of several of the lower organisms given. The author concluded by remarking that what we now believe to be simple may not be so in reality, as not only the extreme minuteness but also the great transparency of minute forms may conceal their structure from our limited powers of vision.

The paper was followed by a discussion in which the Chairman, Secretary and Mr. Ince took part.

A vote of thanks to Mr. Shapley was moved by the Secretary, seconded by Mr. Short, and carried unanimously.

The Secretary then read the following Report on Materia Medica, by Mr. W. Elborne:—

A Note on Commercial English-prepared Cod Liver Oil.

BY WILLIAM ELBORNE,

Assistant-Lecturer on Materia Medica and Pharmacy, Owens College.

The Gadidæ or Cod tribe are a family of fishes belonging to the Malacopterygious or soft-finned order. They include among others—

Gadus Morrhua	Cod,
,, æglefinus	Haddock,
,, molva	Ling,
Merlangus vulgaris	Whiting,

and are found for the most part in the seas of cold or temperate climates; from their size and tendency to congregate in particular localities, as well as from the wholesomeness of their flesh, they are consequently of great importance to man. The livers of these fish also yield valuable oil, notably that of the common cod, *G. Morrhua*.

As is well known, the chief seats of the cod-fishery are the banks of Newfoundland and the west coast of Norway, where great care appears to be bestowed upon the selection of the livers and subsequent extraction of the oil. The livers, being taken as fresh as possible, are carefully examined, those which are poor or injured being rejected; the selected livers are then well washed and dried, and afterwards put into open barrels where the oil slowly exudes and is ladled from the surface. When filtered this forms the "natural straw-yellow coloured"

oil of the first quality. The livers are next transferred to a kind of water-bath, and heated to 180° F., yielding a second quality oil of a pale colour, and, by raising the temperature, inferior oils are subsequently obtained known as the light brown and dark brown oils, the latter being used chiefly by tanners and curriers.

Owing to the great increase in price of the Newfoundland and Norwegian oils during recent years the home production of oil has experienced an unwonted stimulus; large quantities being prepared at Grimsby, Whitby, Aberdeen, and other large fishing stations in the north.

The peculiarities respecting the source and preparation of the English oil, I am informed, are as follows:—A promiscuous mass of cod, haddock, ling, and whiting livers are thrown into a large tub directly they are brought ashore, stirred up with a stick, and allowed to remain until slight decomposition has taken place, the effect of which causes the rupture of the cells containing oil, which latter then escapes and rises to the surface. The oil being removed, the livers are afterwards submitted to a steaming process similar to the Norwegian method. In physical characters, taste, and odour English-prepared cod liver oil and haddock oil are undistinguishable from the famed Newfoundland and Norwegian oils (reputed to be extracted from the livers of the *cod* only).

Owing to the similarity in chemical composition of marine animal oils in general, the difficulty attending the examination and recognition of fish oils yielded by the same genus becomes more apparent.

The following, however, is a tabulated list of some results arrived at in examining seven samples of oil in reference to their specific gravity, viscosity, and rise of temperature on admixture with sulphuric acid:—

Samples of oil.	Fresh Norwegian Cod Liver.					Fresh Cod Liver English (Grimsby) Oil.	Fresh Haddock Liver (Aberdeen).
	No. 1.	No. 2.	No. 3.	No 4.	No. 5.	No. 6.	No. 7.
Specific gravity	·927	·929	·930	·926	·926	·930	·931
Lowest temperature at which it remained perfectly clear	Fah. 20°	28°	30°	26°	24°	40°	32°
Opaque	14°	22°	26°	20°	22°	36°	26°
Solid	8°	14°	16°	18°	10°	20°	16°
Viscosity	14·1	13·8	14	15·8	15·9	13·5	12·45
Rise in temperature . . .	64°–224°	64°–232°	64°–238°	66°–218°	67°–232°	64°–238°	64°–242°

The specific gravities of the above were taken at 60° Fah., in a specific gravity bottle, and the solidifying point by use of a freezing mixture of ice and salt.

The viscosity or fluidity of the oil was determined by ascertaining the rate at which it flowed through the fine aperture of a Mohr's burette as compared with water through the same aperture, and at the same temperature (20 seconds = 1).

The rise of temperature which occurs on mixing a fixed oil with concentrated sulphuric acid (specific gravity 1·845) is a reaction which has been employed by Maumené, Fehling, and others. In this case Fehling's method was followed, 6 c.c. of oil being placed in a very small white gallipot and its temperature noted, 2 c.c. of acid was then gradually added from a burette, the mixture stirred with a delicate thermometer and its highest temperature noted. In conducting these reactions the Grimsby oil (No. 6) frothed over on addition of the acid; in Nos. 1, 2, 3, 4, 5 a brown film was left on the inside of each gallipot, and in No. 7, a black film.

In reference to this report, I regret to state that time has not permitted the extension of the above table to a similar examination of other samples of cod, haddock, ling and whiting oils, which latter I had intended preparing myself; nevertheless, in due course I hope to be able to furnish such data.

Looking at the table, however, as it stands, it is noticeable that while the specific gravity of Norwegian oil is fairly constant, there are considerable differences in the temperatures at which they become opaque and solid and that their rise in temperature increases with their specific gravity; also that the English prepared cod liver oil and haddock oil are more susceptible to turbidity on being submitted to low temperatures, probably owing to the fact that the margarine or solid fat has not been previously removed by exposure to a low temperature (a process to which I believe the Norwegian and Newfoundland oils are subjected). From a commercial point of view, haddock liver oil is considered a "cod liver oil" superior to the English prepared cod liver oil referred to in this paper.

In conclusion, I beg to thank Mr. James Hart, for much valuable service and information, also Mr. Hermann Woolley.

The report was discussed by the Chairman, Secretary, Messrs. Cullinan, McDermott, Rees and Short.

The meeting then adjourned.

SOCIETY OF ARTS.

Fermentation and Distillation.

A course of Cantor lectures on "Fermentation and Distillation" was commenced on Monday, the 12th inst., by Professor W. Noel Hartley. The lecturer at first explained the principal methods used in the conversion of the starch both of grain and potatoes into sugar. In the treatment of the former malted grain is always used, the saccharification being carried on at the temperature of 73° F., almost invariably obtained by means of steam passing into a false jacket, through which, after the conversion of the starch into sugar, cold water is passed to reduce the temperature. The formation of lactic acid during this operation, the lecturer said, was rather advantageous than otherwise, because the conversion then took place more completely; phosphoric acid also tended to produce the same result. Before operating on potatoes it is usual to ascertain the proportion of starch they contain, so as to enable an estimate to be formed of the quantity of water needed for the preparation of the mash. They are then submitted to the processes of washing, cooking and mashing. The saccharification is now frequently effected by treatment with sulphuric acid. The starch grains, after being previously separated from albuminous matter by water, are heated with sulphuric acid for five hours; lime is then added, and the whole

mixture is placed in a large vat. Professor Hartley then proceeded to classify the carbohydrates in three groups: (1) the amylose or starch group, $n(C_{12}H_{20}O_{10})$, including starch, dextrin, arabin, cellulose, lichenin, glycogen, inulin, and tunicin; (2) the saccharose, or cane sugar group ($C_{12}H_{22}O_{11}$), including saccharose, lactose, maltose, synanthrose, melitose, and melizitose; and (3) the glucose, or grape sugar group ($C_6H_{12}O_6$), containing dextrose, levulose, galactose, arabinose, eucalypte, inosite, sorbite, and dambonite or bornesite. The lecturer explained the connection between these groups and their constituents by means of separate quantities of water and carbon, and showed that if the elements of a molecule of water were added to starch maltose ($C_{12}H_{22}O_{11}$) was represented, whilst the abstraction of the elements of a molecule of water resulted in erythro-dextrin, which also could again be reduced to achroo-dextrin. Professor Hartley then referred to some of the differences in starch grains: those of barley burst at 99° F., and swell until a temperature of 144° F. is reached; those of maize burst at 122° F. and swell until the same temperature is arrived at; and those of acorns do not burst until 135° F., swelling until 190° F. is reached. The lecturer then mentioned some of the soluble ferments, and remarked upon the derivation and properties of diastase, maltine, invertin, emulsin, papayin, myrosin, ptyalin, pepsin and pancreatin. Passing from these to the glucosides, he mentioned that amygdalin ($C_{20}H_{27}NO_{11}$) could be split up into bitter almond oil, prussic acid and glucose, tannin ($C_{27}H_{22}O_{17}$) into gallic acid and glucose, salicin ($C_{13}H_{18}O_7$) into saligenin and glucose, and arbutin ($C_{12}H_{16}O_7$) into hydroquinone and glucose. Professor Hartley then remarked upon the necessity of maintaining an exact temperature during saccharifying operations, not only because too great a degree of heat destroys the diastase when malt is used, but also because whilst 80 per cent. of maltose and 19 per cent. of dextrin are obtained at a temperature of 140° F. a rise of 9° in temperature leads to a loss of 40 per cent. of maltose and a corresponding increase of dextrin. In concluding the lecture Professor Hartley said many of these results obtained were due to the work of Brown and Hiron and O'Sullivan, though he mentioned the names of many others who had contributed to them.

Cupro-Ammonium Solutions.

A paper upon "Cupro-Ammonium Solutions and their Use in Waterproofing Vegetable and Paper Tissues" was read by Dr. C. R. Alder Wright before the Chemical and Physics Section of the Society of Arts on Thursday, the 8th inst. It commenced by defining a cupro-ammonium compound as a product of the combination of ammonia with copper compounds, and stated that salts of copper usually combine with four proportions of ammonia. Cupro-tetrammonium sulphate $(Cn_2NH_3)SO_4,H_2O$ is obtainable in crystals by the admixture of a concentrated solution of copper sulphate and a solution of ammonia; the salt being separable by the addition of a very strong ammonia solution or by shaking with alcohol. Similarly other cupro-tetrammonium salts can be obtained. A closely-related compound is cupro-ammonium hydroxide, prepared by dissolving cupric hydrate or agitating metallic copper in ammonia solution in presence of air; the copper oxidizes and dissolves in the ammoniacal liquor, which assumes a blue coloration more or less deep according to the time of agitation. The instability of these compounds under the influence of heat and water, alone or conjointly, is very marked, though considerably lessened in the presence of a large excess of ammonia. The cupro-tetrammonium sulphate is decomposed by the addition of a large bulk of cold water, a basic insoluble copper sulphate being formed together with free ammonia and ammonium sulphate. The cupro-ammonium hydroxide solution is decomposed by addition of alcohol, a blue precipitate of hydrated copper oxide being thrown down, or by boiling, when anhydrous black copper oxide is formed and ammonia liberated. It is to the more stable forms obtained by dissolving copper salts or copper hydroxide in an excess of ammonia solution, that the name of "cupro-ammonium solutions" is given. These solutions have long been known to possess the property of apparently dissolving cellulose and various allied substances; paper, cotton-wool and similar materials disappear and are apparently dissolved upon digestion in these fluids. Some chemists assert that the substances are simply gelatinized and remain in the solution in a transparent form; but the reappearance of the cellulose as a flocculent precipitate upon neutralization by an acid or the addition of potassium cyanide solution points to a case of true solution. On evaporation to dryness of a cupro-ammonium solution in which cellulose has been dissolved, a more or less gummy residue is obtained, containing the cellulose intermixed with copper oxide and other salts; if, however, the cellulose be in excess, black oxide of copper is often not formed at all, but a green varnish-like mass of cellulose combined with copper, so that if the solution be evaporated on the surface of paper, calico, etc., just dipped in the solution, each filament of the fabric used employed becomes coated with the mass, and the whole welded together. This cement-like mass of cupro-cellulose, as it may be termed, being insoluble in water, communicates its water-resisting properties to the material so treated; the presence of copper also proves advantageous in protecting the substance and making it less prone to the attacks of insects or mould, even when kept under conditions favourable to the growth of animal and vegetable life of a parasitic nature. The use of a solution of cupro-ammonium hydroxide is found preferable to that of solutions containing cupro-ammonium salts, for not only is the action in cellulose more energetic for a given amount of copper and ammonium in solution, but various other advantages are gained. As fabrics treated with cupro-ammonium sulphate solutions will contain the soluble sulphate of ammonium and sometimes that of copper when dried, there is a tendency for the material to become porous if exposed to the dissolving action of water and also to cause an unsightly efflorescence under other conditions. On the contrary if cupro ammonium hydroxide solutions be used, all the ammonia present is volatilized, and may be recovered during the drying process; whereas with cupro-ammonium sulphate solution a considerable fraction of the ammonia is fixed as sulphate, and so lost. It is further observed that whereas iron precipitates the copper in solutions of ordinary copper salts, no such action takes place with cupro-ammonium hydrate solutions, so that cast or wrought iron tanks for the reception of the liquor, as well as steel rollers and machinery employed in contact with the liquor or with fabrics moistened therewith, can be used with impunity. This peculiarity is the more remarkable as this non-action is not observed with metal zinc, which precipitates the copper with about equal facility, whether the copper be in the form of an ordinary copper salt or in that of a cupro-ammonium solution. The use of copper or brass in the construction of the machinery employed must also be studiously avoided, otherwise corrosion and injury is speedily brought about. A bath containing a mixture of cupro-ammonium, and the analogous zinc-ammonium hydrate solutions, may be used with advantage for certain purposes. The zinc compound alone does not sufficiently pectise cellulose to give good results; but when used in conjunction with cupro-ammonium hydroxide, pectising is brought about by the copper solution, whilst certain advantages are obtained by the presence of the zinco-cellulose in the finished goods. As the subject of the manufacture of both cupro- and zinco-ammonium solutions has recently been dealt with in a paper read before the Society of Chemical Industry, the lecturer did not refer to it further than to state that the fluids are obtained by the simultaneous action of air and ammonia water on metallic copper (or

brass, if a mixture of cupro- and zinco-ammonium hydroxides is required), due attention being paid to the recovery of the large amount of ammonia necessarily carried away by the "spent air" during the operation. The good results obtained in laboratory experiments have led to a company being formed, having their works at Willesden for the manufacture of fabrics, principally paper and canvas, treated with cupro-ammonium solutions so as to waterproof them and render them rot-proof, and practically free from the attacks of insects and moulds. Specimens have been exhibited at South Kensington in 1872 and in the Paris Exhibition of 1878, but since the latter date many improvements have been made in the nature of the plant requisite for the manufacture and the process for obtaining the essential fluid facilitated, thus enabling marketable products to be produced. These products consist of several classes and are generally known under the name of "Willesden" goods; the rope, cordage, etc., is prepared by simply dipping the made-up materials into a bath of cupro-ammonium solution, using certain precautions as to the mode of immersion and its duration, and the strength of the solution; upon drying not only is a varnish-like dressing obtained, but the fibres are strengthened by the cementing together, and many advantages are claimed as compared with similar goods protected by tarring or treated with other preservative compositions. The canvas is prepared in a somewhat similar manner, saving that the fabric to be treated is usually unwound from one roller and rewound upon another, after passing successively through the bath and a succession of drying rolls similar to those of a paper-mill. Paper is either treated in the same way as the canvas, or else a number of layers are pressed into one solid sheet of continuous lengths, whilst still pectised by the action of the cupro-ammonium solution. The uses to which these materials may be applied appear indefinite, ranging from the applications to stationery and bookbinding to the purposes of building both boats and houses. Among many illustrations shown by the lecturer to prove the superiority of fabrics treated with cupro-ammonium solutions over ordinary materials, was a specimen of paper immersed for eight consecutive weeks in a steam boiler at a pressure of 60 lbs., the only apparent change being a slight cockling at the edges. These fabrics possess many advantages over galvanized iron, both as articles of transport and for use under a tropical sun, weighing less than one-tenth a relative quantity of galvanized iron, and also allowing of being put up in compact rolls so that no space is wasted in packing; the cost of transit will therefore be less heavy. Further, being comparatively non-conducting, the heat of a tropical sun is less felt under a roof of this kind than under a metallic one, whilst no inconvenience is felt from condensation of moisture on a cold night. No change is manifest, and no unpleasant odour emitted under the hottest tropical sun, whilst no painting is required to prevent corrosion or leakage, though the surface takes paint readily if required for decorative purposes. In case of fire, although not absolutely indestructible, the "Willesdenized" materials will not readily feed the flames owing to the copperizing and compacting processes employed.

During the discussion which followed the reading of the paper many suggestions were made as to the uses to which fabrics treated with the cupro-ammonium solutions might be applied. Questions were raised as to whether the copper was an essential constituent of the fabric so treated, and also whether a plan could not be devised for submitting the materials to treatment with cupro-ammonium solutions before being made up, thus ensuring not only a superficial layer of "cupro-cellulose" but a fabric thoroughly impregnated with the solution. As to the application to electricity the fabrics were described as not ready conductors, but could not be used as safe insulators. Dr. Atcherley remarked that one of the first discoverers of the process of treating fabrics with cupro-ammonium solutions was the late Dr. John Scoffern, and also stated, as an example of the capability of these fabrics to withstand the attacks of insects, that a specimen had been placed in a white ant's nest for a period of six weeks without sustaining the slightest injury.

Parliamentary and Law Proceedings.

Poisoning by Rat Poison.

An inquest has been held at Barrow, before Mr. John Poole, on the body of Mr. T. H. Baynes, who had died from the effects of poison.

The following is the evidence relating to the sale of the poison:—

Mr. John Bryden, chemist, Old Barrow Island, said the deceased came into his shop on Monday afternoon, April 21, and asked if he had anything that would kill rats, as they were eating the ledgers in the office. Witness told him he had, and showed him several different kinds. He took one in a box, for which he paid a shilling. Witness could not say what it contained. He did not make it himself, but got it from London, and it was called "Rough on Rats." Could not say if it contained arsenic or strychnine.

The Coroner: Did you enter it in your book?

Witness: No.

The Coroner: Why?

Witness: Because I knew him so well. There is a list of poisons that we should enter, but this is not one of them.

The Coroner: You say you do not know what it contained?

Witness: Because it was not one of those mentioned in the Act.

The Coroner: But that does not exempt you under the statute from entering it, does it?

Witness said there were some rat poisons they entered in the book, even when sold to persons they knew.

The Coroner: Why did you not do it in this case?

Witness: I did not think of it at the time. The deceased was talking in his usual way, as he knew him very well. He (witness) had never opened any of these packets to see their contents. The deceased purchased the only one he had, but he had since got another packet in consequence of this case; but had not yet examined it. Witness knew the deceased well and did not notice anything wrong in his manner.

By Mr. Nalder: Had known the deceased for about nine or ten years. When he came to the shop witness was of opinion that he was on his way from dinner. He seemed to be perfectly calm, and in a happy frame of mind. Witness did not notice the slightest difference in his demeanour. They had no conversation except that relating to the sale of the rat poison. Deceased had been a customer of witness's for a long time, but never remembered having sold him rat poison before. Was sure he could not have bought any without witness knowing it. Deceased had dealt with him for about eight years, but more so since he had commenced business on Old Barrow.

By the Coroner: The deceased was not in the shop before on the same day.

Dr. Murray said on Monday evening, the 21st, he received an urgent message to proceed to the house of Mr. Baynes, West View, as his son Tom was either very ilthr dying. Witness proceeded there at once, and found o e deceased lying on the floor quite dead. He was partially dressed. Witness also observed some vomited matter in a basin in the bedroom, which consisted of a stringy mucus with a little blood. On Wednesday afternoon witness made a *post-mortem* examination of the body, and found it was well nourished. On examining internally he found the liver quite healthy. The lungs were also

healthy but congested. The stomach contained about eight ounces of bloody fluid. The lining membrane of the stomach was intensely congested and red all over. There were no ulcerations. On the surface were particles of what appeared to be a powder. On examining the heart he found it healthy and muscular; the right side being full of blood and the left comparatively empty. Witness afterwards placed some of the powder under the microscope and found crystals of some metallic compound. From the appearance of the body immediately after death, and the vomited matters, and from the facts disclosed by the *post-mortem*, and the total absence of disease, and from what little he had heard of the case, he was forced to the conclusion that he did not die from natural causes, but from the action of some irritant poison, the mode of death being by syncope, or failure of the heart's action.

The box of rat poison mentioned by the witness Bryden was produced at this point. The witness on examining it said it was the same colour as the powder found in the stomach of the deceased.

After some further evidence the Coroner summed up, saying that there was no doubt deceased had purchased this poison with a view of taking away his life. The Act for the Sale of Poisons, 31 and 32 Vict., was passed to prevent persons getting poisons in the way this had been got. The Act was intended to meet cases of this kind, and in cases where precaution was necessary. If that precaution had been used in the present case it might perhaps never have happened. The deceased might have gone home and the strain on his mind might have passed away.

The Jury returned a verdict "That the deceased died from the effects of poison taken during a fit of temporary insanity." They also recommended that the Act with regard to the sale of poisons should be strictly enforced. —*Ulverston News.*

Obituary.

Notice has been received of the death of the following:—

On the 19th of February, Mr. Joseph Raper, Chemist and Druggist, Bradford. Aged 75 years.

On the 4th of March, Mr. Henry Jones, Chemist and Druggist, Wimborne. Aged 46 years.

On the 18th of April, Mr. Henry Cheese, Pharmaceutical Chemist, Coleford. Aged 51 years.

On the 20th of April, Mr. Walter Herbert Priestley, Chemist and Druggist, Newton Abbott. Aged 29 years. Mr. Priestley was an Associate of the Pharmaceutical Society.

On the 1st of May, Mr. John Bryne, Chemist and Druggist, Cheddar. Aged 51 years.

On the 2nd of May, Mr. Frederick Baker, Chemist and Druggist, Ottery-St.-Mary. Aged 48 years.

On the 3rd of May, Mr. James Leare, Chemist and Druggist, Sunbury. Aged 81 years.

On the 7th of May, Mr. Robert Thomas Ainsworth, Chemist and Druggist, Rusholme. Aged 38 years.

On the 8th of May, Mrs. Alice Lawton, Chemist and Druggist, Dukinfield. Aged 55 years.

On the 10th of May, Mr. William Andrew, Chemist and Druggist, Bradford, near Manchester. Aged 51 years.

Reviews.

THE COLONY OF BRITISH HONDURAS: ITS RESOURCES AND PROSPECTS. By D. MORRIS, M.A. London: E. Stanford. 1883.

The author was invited by the Government to pay a short visit to the colony of Honduras in order to investigate its flora and economic resources. The result is the account, or rather the report, contained in this work; plants of purely botanical interest being for the most part omitted, but special attention being devoted to the industrial productions of British Honduras.

The name of the colony has been chiefly connected hitherto with the trade of mahogany and logwood; and the writer endeavours to show that the place offers natural facilities for more extensive commercial enterprise.

It is somewhat discouraging to find that a fair amount of capital is indispensable to the successful colonist; and as £1000 seems the lowest estimate, a new field of energy is offered rather to the experienced cultivator than to a young man seeking to advance his fortunes in an unexplored and rising country.

It appears, however, that British Honduras has a special opening not only for sugar plantations, cacao and coffee, but for the smaller industries connected with fruit and vegetables.

The most interesting plant found wild in the forests is the india rubber tree, the *Castilloa elastica.*

The original supplies of india rubber are likely at no distant date to fall short of the demand; and as this tree is most abundant throughout the colony, great hopes may be expected from its cultivation.

The mode of extraction and preparation are detailed at length; and Mr. Morris, adopting the favourable opinion of Mr. Clements Markham, considers that this Central American rubber is well worthy of attention. The authorities of Kew have procured various rubber seeds and plants, and distributed them far and wide for the purpose of establishing them under cultivation; many cannot be easily cultivated under ordinary circumstances. The castilloa tree offers all round the most advantages, as it strikes its roots far into the ground without exhausting the surface soil; it grows with wonderful rapidity, soon forming a handsome shade tree; and lastly it gives a return in rubber within eight or ten years, while most other trees do not mature for some twenty or thirty years.

Amongst the economic plants mentioned are the vanilla, indigo, arnatto and the guaco; the last known to us as a febrifuge and anthelmintic, and possessing a local reputation as a supreme antidote against serpent's bites.

The larger industries, such as the fibre-producing plants, the sugar cane and others, hardly concern the pharmacist, but the description of nutmegs, pimento, cinnamon, cardamoms and spices generally, from an economic point of view will repay perusal.

The system of cash payment, as specially visible in the fruit trade, has given an entirely new impetus to commerce. The planter was formerly in the hands of an agent; now he can choose his own market, and secure immediate returns.

Intending settlers are advised to gain practical experience from an established colonist, before venturing on their own account, and to trust to commercial undertakings, as there are no salaried appointments in British Honduras.

The book is a careful record of the commercial capabilities of the colony, founded upon personal investigation.

MEDICAL GUIDE TO THE MINERAL WATERS OF FRANCE, AND ITS WINTERING STATIONS. By A. VINTRAS M.D., Physician to the French Embassy. London: J. and A. Churchill.

The serious study of the therapeutics of mineral waters has become a distinct branch of medicine, and one quite worthy of cultivation. As an adjunct to ordinary practice these waters are invaluable. Of late years also many springs which owed their reputation either to local tradition or to some happy accident of patronage which made them fashionable have been carefully investigated. Eminent physicians have devoted themselves to this

special subject; and the result has been to the undoubted advantage of patients to whom ordinary treatment offered only partial relief. As a secondary and inevitable consequence, a wonderful impetus has been given to commercial industry. Small villages, picturesque and neglected, have risen into importance; while many thousand visitors annually crowd to the more celebrated health-resorts.

This book, by Dr. Vintras, is limited to the mineral springs of France, to which it forms a general not a particular guide. There is no attempt in its pages to exalt one locality to the detriment of another; but the intention is to describe scientifically and impartially the various French springs, to explain their medicinal value, and to give full information respecting them both to the medical world and to the public.

Acknowledgment is paid at the outset to the researches of Dr. Durand-Fardel, who has done so much to elevate hydrotherapeutics to the position of a special science.

By the term mineral water is meant natural waters which are employed in therapeutics in consequence of their chemical composition or temperature. The proportion of the mineral principles which they contain cannot be taken as distinctive, since some of the most interesting are the least strongly mineralized. The extended action which they exercise upon the constitution, on the whole of the secreting system, on the capillary circulation and on the ultimate phenomenon of nutrition, separates them from other pharmaceutical remedies. A mineral water is not a medicine which can be kept at hand and used at will; and with regard to its employment, clinical study in the hospital teaches nothing, individual experience obtained by special investigation must be the only guide.

The chemical analysis of a water is to a certain extent hypothetic, for the combinations in which its constituent elements are presented are not extracted in the form of salts; and the principles by which their acids and bases are brought into connection with each other and expressed in definite proportions are not absolute. Still the slight dissidence of chemists cannot bring any serious modification to the therapeutical character of a spring. Iron is a most usual ingredient; arsenic frequently accompanies it, especially in the mountainous region of Auvergne. Lithium has been detected by spectrum analysis; the alkalies are present in variable and characteristic proportions; but soda frequently predominates, and, according to Dr. Vintras, so great is its importance that the therapeutical value of a mineral water can be almost accurateiy measured by the quantity of soda which it contains.

Sufficient data have been accumulated to reduce mineral waters into a system, and to arrange them according to a definite classification.

The French system consists of four main groups:—Sulphuretted, chlorinated, bicarbonated, and sulphated. There are two other groups, indeterminate, as the simple thermal and the feebly mineralized waters; and as a supplementary group, ferruginous waters.

In adopting this classification it should be observed that predominance is not decided by the mere figures furnished by chemical analysis exclusive of therapeutic value. In the sulphuretted waters, the sulphur itself exists in an inferior proportion to the other substances, yet it determines their distinctive character. The ferruginous waters contain iron always in a secondary proportion and only as a base. They cannot, therefore, be grouped amongst the waters the classification of which is due to the predominant acid which they contain; and as iron in some proportion is almost an invariable constituent, such waters are alone reckoned ferruginous where the iron exercises a distinct medicinal influence.

Taking this system as a base, Dr. Vintras proceeds to describe in rotation the best known mineral springs in France; showing in what cases they are to be recommended, and when their use would be prejudicial to the patient. The latest analysis is in each case subjoined, and the method of their application is sketched from actual investigation.

The wintering stations occupy the concluding portion of the volume, and while Nice, Pau, Mentone, Hyères, Cannes and Biarritz are fully noticed, many other less known stations are introduced to the consideration of the reader. We can hardly imagine a more useful volume as a guide to a physician anxious to relieve a patient from a long list of maladies or their consequences which do not yield to the exhibition of pharmacopœial remedies. The pharmacist may consult these pages with advantage, as he can scarcely afford to be unacquainted with a system of medication which is now decidedly in vogue. Very sensible directions are scatteied through the volume, both in the way of precaution and advice.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Spirit of Nitrous Ether.

Sir,—In reply to Mr. Abraham I have only to remark that in my paper I do not admit, as he states, "the fact" alluded to by him, namely, that the standard alkali *per se* decomposes the spirit during the estimation of acidity. The decomposition which I allude to is quite a different thing, and is discussed in the paper, means for limiting the error arising therefrom being also given.

119A, *George Street, Edinburgh.* Peter MacEwan.

T. S.—(1) *Bryum cæspitium.* (2) *Funaria hygrometrica.* (3) *Mnium hornum.* (4) *Polytrichum commune.* There is no collective work on British cryptogams of more recent date than the second edition of 'English Botany.' A work on British mosses in now being issued in parts by Dr. Braithwaite, The Ferns, Clapham Rise.

A. M.—Your question is one that turns upon a legal point, and we are therefore unable to advise you concerning it. But with respect to the first title mentioned we fail to see upon what ground you expect to be able to register and thus acquire an exclusive right to it, when you are aware that it is already in use. For our opinion as to what constitutes a "patent medicine" see the *Pharmaceutical Journal* for May 10.

An Apprentice.—See a paper on "The Preparation of Syrups of the Lactophosphates" in *Pharm. Journal*, [3], vi., 881.

S. P. S.—An article on "The Preservation of Plants for Herbaria" will be found in the *Pharmaceutical Journal*, [3], vol. iv., p. 754. A beginner will find Holmes's 'Botanical Note-Book' a useful work.

G. E. R.—(1) Such a person could not legally carry on the business, except in the capacity of a trustee or executor, and then only with the assistance of a qualified pharmacist. (2) We understand that the publishers have communicated with you on this subject.

O. H. Bott, D. Davies, Kintyre, A. P. S. and *Cymro.*—We think it hardly desirable to publish your letters, as the context of the passage to which you object shows that, although it was written somewhat unguardedly, what our correspondent wished to condemn was an undue parade of the qualification.

J. T. Hall.—(1) We are unable to supply you with a formula for a preparation resembling the proprietary article mentioned. (2) It is difficult to obtain a satisfactory result without an admixture of wax or some similar substance.

J. C. Lloyd.—It might be beneficial on account of its antiseptic properties.

Communications, Letters, etc., have been received from Messrs. Stenhouse, Brown, Sawer, Watts, T. and H. Smith, Dott, Talbot, Davies, J. W. W.

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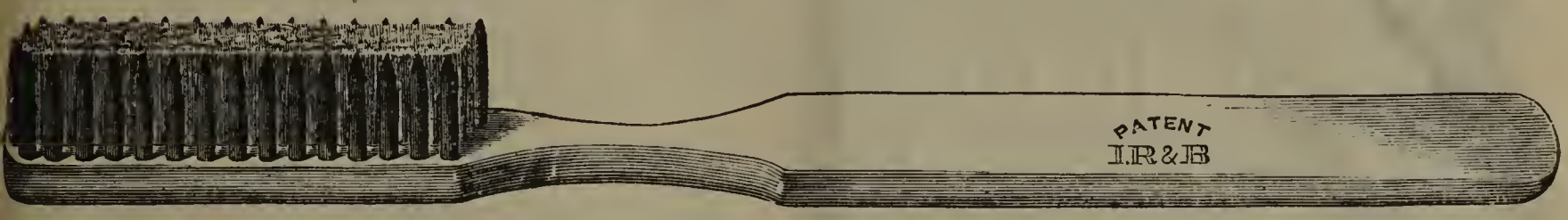

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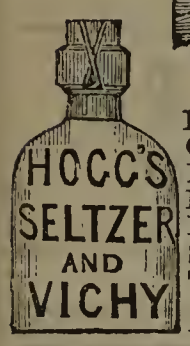

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6 „ 8 „	8s. 6d.	„
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TESTIMONIAL.

BUCKLEY HOUSE, LLANDUDNO,
March 10th, 1884.

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I am, Gentlemen,
Yours very truly,
M. A. S.

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Mr. T. Cule
„ M. I. Jones
Mr. J. E. Milford
„ J. Wood

MINOR.

Mr. T. Burgess
„ I. G. Dunn
„ D. T. Evans
„ S. Fowle
„ J. L. Hallawell
Mr. T. W. Madge
„ J. Owen
„ H. Ridley
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SCHOOL OF PHARMACY.
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OF
Chemistry & Pharmacy.

The next Session will commence on Monday, September 1st.

Students intending to enter on the above date are requested to send in their names as early as possible, so that benches may be reserved for them.

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MAJOR.

Mr. S. Marshall.

MINOR.

Mr. W. G. Atkinson
„ G. M. Dunn
„ J. Christie
„ B. Carter
„ G. P. Chifney
„ H. F. Drake
„ J. W. S. Freshney
„ F. O. Golding
„ T. Groves
„ G. E. Hare
„ A. M. Hickley
„ G. Hodgson
Mr. T. Jenkins
„ T. Lewis
„ J. F. Marlar
„ H. E. Russell
„ W. G. Skoulding
„ J. A. Sutcliffe
„ J. W. Taylor
„ A. Tennant
„ A. J. Timbury
„ E. H. Tugwell
„ L. Verdon

PRELIMINARY.

Mr. A. H. Carpenter
„ W. S. Edwards
„ A. P. Evans
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FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing Sept. next.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

ENGAGEMENTS WANTED.

WHOLESALE.—In London house, by advertiser. 4½ years' Retail experience. M. N. O., care of Mr. Edwards, 227, Walworth Rd., London, S.E.

AS ASSISTANT, in good class business. Good experience. Moderate salary. Disengaged. Age 34. MAJOR, 307, Vauxhall Bridge Rd., S.W.

AS MANAGER of Branch, or as ASSISTANT. Varied experience. Able to Extract Teeth. Accustomed to Dispensing, Prescribing, light Retail, &c. THETA, Mr. Sandiland's, Bicester, Oxford.

AS ASSISTANT. Age 26. Height 5ft. 10in. Varied experience. Town or country. Disengaged. A. J. G., 62, Vassall Rd., Brixton, S.W.

AS JUNIOR or IMPROVER. 3 years' experience. Good references. Passed Preliminary. Age 19. Height 5ft. 9in. Disengaged June 5th. D. JONES, 5, High St., Newport, Mon.

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JOHN PHILLIPS, Secretary.

48, Chancery Lane, W.C., 15th May, 1884.

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AN ASSISTANT, accustomed to a brisk country trade. Must be a quick and accurate Dispenser, of good appearance and address. Undeniable references as to character and ability. State full particulars, to Box 144, Post Office, Nottingham.

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IMMEDIATELY.—A Junior ASSISTANT, about 21 years of age, of gentlemanly appearance and address, accustomed to a good country business. Apply, stating age, height, salary and last reference, to PHILIP WILLIAMS, Pharmaceutical Chemist, Horsham, Sussex.

A JUNIOR ASSISTANT, experienced, thoroughly reliable, trustworthy, willing, and industrious, for Retail, Prescribing, and Dispensing business. A business-like man fairly treated. Half holiday weekly. Sunday duty once fortnight, from 6 to 9.30 p.m. Apply, stating age, salary required, to Mr. W. B. GREIG, 591, Old Kent Rd., S.E.

J. THROSSELL, Chemist, Cambridge, requires a trustworthy ASSISTANT, accustomed to Prescribing and Dispensing, to whom leisure given for study would be considered as partly an equivalent for services rendered.

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ABOUT the 26th May.—An ASSISTANT, accustomed to good class Retail and Dispensing. Apply, stating age, height, salary, and references, to TENISON SMITH, Ryde, I.W.

AT once.—A good ASSISTANT for light Retail and Dispensing trade. Age about 24. Apply, stating age, height, and salary required, with references and carte if convenient, to Messrs. GEORGE & WELCH, Worcester.

MANAGER, qualified as Chemist, in a small country business. Unexceptional references absolutely necessary. Must be single. No other assistant. No Sunday trade. Weekly half-haliday. Salary £50, in-doors. Apply, stating age, height, names of last employers and references, and enclosing photo., E. GEE, Solicitor, Shannon Court, Bristol.

AN ASSISTANT. Minor qualification. Apply, personally if possible, to W. H. STICKLAND, 23, Cromwell Pl., S.W.

ASSISTANTS WANTED.

JUNIOR Assistant, with Minor qualification. Accustomed to Dispensing. To board in the house, but provide own sleeping accomodation. Apply, stating usual particulars, to Sharpe & Son, 34, High St., Notting Hill, London, W.

IMMEDIATELY.—A Junior Assistant, accustomed to Dispensing. Apply, stating particulars as to age, salary, &c., to B., Messrs. Evans, Gadd & Co., Wholesale Chemists, Exeter.

A JUNIOR or Improver, out-door, in a General Country business with wholesale. State usual particulars and terms, enclosing carte, B. Adams, Market Pl., Mansfield. An out-door Apprentice also required.

AN Assistant.—Apply, stating age, height, references, salary required, and enclose carte, to G. Brookes, Medical Hall, Llandudno.

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A JUNIOR Assistant for a few weeks during summer holidays. Apply, J. F. Thursfield, Chemist, Kettering, Northamptonshire.

IMMEDIATEY.—An Assistant, about 22 years of age, accustomed to good Di-pensing and Retail business (one only kept). Apply, with usual particulars, stating age, height, salary required, with references, to C. H. Tupholme, 394, King's Rd., Chelsea, London, S.W.

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BUSINESSES FOR DISPOSAL.

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Chemists' Transfer Agency,

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MR. EDWIN B. VIZER, Pharmaceutical Chemist, having been engaged in the business for the last 36 years, in London and the provinces, has a wide practical experience of the varied character, value and requirements of such businesses, and being personally acquainted with a large circle of clients throughout the country, is prepared to offer special advantages to gentlemen desiring to purchase or dispose of businesses.

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LONDON, N.—In a rapidly increasing neighbourhood. A first-class Dispensing and RETAIL. Returns over £700. Price £750.

LONDON, S.E.—A Retail BUSINESS. Recently returning £600, but through neglect fallen away. In good hands would rapidly increase. Price £300.

LONDON, E.C.—A small Retail and PRESCRIBING. Price £150.

LANCASHIRE.—A thoroughly sound and good BUSINESS. In main thoroughfare of large town. Good house and shop, with every accommodation. Returns £770. Price £625.

NORTHAMPTONSHIRE.—An old established PHARMACY. In best part of a large city. Owner retiring. Price £600.

SURREY.—An exceptionally good opportunity. Post Office attached. Returns £400. Price £240.

SURREY.—A small ready-money Retail and PRESCRIBING. House with garden. Returns about £300. Price £250.

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Good positions for new openings on register.

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HAVE THE FOLLOWING BUSINESSES FOR DISPOSAL:—

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2. LONDON, S.E.—Ready-money light Retail, Prescribing and DISPENSING. Nicely fitted and very well stocked. Returns about £550. Large profits. Full prices obtained. Post Office attached nearly covers rent. Price £450. Capital opportunity.
3. LONDON, E.—Returns about £500. Net profits over £300. Price £450. Part can remain.
4. LONDON, E.—Returns £350. Rent £28. Price £200.
5. LONDON, S.W.—Recently established good Family BUSINESS. All ready money. Nicely fitted and well stocked Pharmacy. Good house on long lease. Rent only £58. Returns now £15 a week, and increasing; will soon be £1000 per annum. Price £650. A bargain.
6. LIVERPOOL.—Good class Dispensing BUSINESS. Returns £350, at very large profits. Price £350, or by valuation.
7. BRISTOL (near).—Good position in rapidly increasing neighbourhood. Returns now £12 a week, and capable of soon being doubled. Well stocked and fitted. Low rent. Price £450. Capital opening for energetic man.
8. WESTMORELAND.—Light Retail, Dispensing and PRESCRIBING, with some Agricultural trade. Returns about £400 under management. Rent £14. Business could easily be doubled with attention. Price £250.
9. SURREY.—Dispensing, Prescribing and RETAIL. Returns £15 a week. Rent £50, on long lease. Price £775.
10. LANCS.—Returns £400. Rent £35. Price £140.
11. NORTH OF ENGLAND.—Returns £1800. Price £950.

T. & Co. have 298 other businesses in Town and Country for disposal. Gentlemen seeking investments are solicited to send particulars of their requirements.

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FOR Sale.—1 6ft. nest 33 mahogany Drawers, with glass labels and glass knobs, 117s.; 1 6ft. Dispensing Screen, with arched mirror centre and marble slab in front, £7; 1 Dispensing Case, with tablet, 4ft. 6in., 60s.; 2 handsome iron Brackets to carry carboys, 30s. each; 3 Specie Jars, with scroll labels, 22in. high, 15s. each; 1 plate-glass Case and Desk, Maw's A 32, 2 doors, 50s.; 1 ditto, 1 door, not plate, 42s. 6d.; 1 8ft. Counter, with glass casing in front, 65s.; 1 handsome plate-glass Wall Case, 9ft. long, 8ft. 10in. high, with 54 drawers under, 2ft. mirror in centre and sponge case in front, £11 15s.; 6 8-gall. Carboys, 17s. each; also the complete fittings of a chemist's shop for £36. Particulars on application to R. TOMLINSON, Medical Fitter, 15, St. Paul's Sq., Birmingham.

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A CHEMIST wishes to place his son, age 19, in very comfortable apartments with a Surgeon-Dentist, of London, whilst studying for Pharmaceutical Examinations, as he is desirous of him acquiring a practical knowledge of Dentistry in addition to Chemistry. Send terms to MACPHERSON, 11, Besborough St., Pimlico.

Midland Counties' Transfer Agency.

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LEICESTER.

VALUATIONS.—It is essential, to prevent disappointment, that engagements should be made early.

Businesses thoroughly investigated for Buyers.

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LAKE DISTRICT.—Good Family RETAIL, with profitable Proprietary Articles, pleasant market town, returns £630, price £350.

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HANTS.—Dispensing and light RETAIL, good corner position, returns £300, capable of considerable extension, price about £250.

LANCASHIRE.—Death vacancy, Mixed Retail and PRESCRIBING, returning under female management £6 week, good position, and capable Prescriber could double it, price £150, less than value of stock and fixtures.

MIDLANDS.—Old established good class RETAIL, with Mineral Water factory, returning £2300, this business, especially the Mineral Waters, is capable of extensive expansion, as it has for some years been virtually under management, price about £1400, and part can remain.

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Member of the Pharmaceutical Society,

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Valuations undertaken for Probate, Transfer, or Arbitration.

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Applications for either the sale or purchase of Businesses inserted in Register free of charge.

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Member of the Pharmaceutical Society, and upwards of 30 years' experience. Prompt attention and advice given in all negotiations connected with vendor or purchaser.

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A SECOND-HAND Mattress. Fig. 12 Maw's list. 72 × 36. Cost £7 7s. Only been used a few times. As good as new. Price £5 10s., or offers. Apply, W. H. NEWSAM, Chemist, Stoke Ferry, Norfolk.

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MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

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MESSRS. ORRIDGE & CO. are instructed to transfer the following businesses, particulars of which, with order to view, may be obtained on application:—

1. LONDON, N.W.—Good class Retail and DISPENSING. Very old established. Returns nearly £750; increasing. Large corner shop, double-fronted. Well situated. Good house and beneficial lease. Large garden. Price about £750.

2. LONDON, N.E.—Retail, Dispensing and PRESCRIBING. Returns £500 yearly. Very profitable. The neighbourhood is rapidly improving. Large house, well fitted shop, with long and beneficial lease. Price about £500.

3. LONDON, N.—Good class locality. Retail and DISPENSING. Returns nearly £700; can be greatly increased. Large house, well adapted for letting off if wished. Price about £400, or offer. Vendor is anxious to sell for family reasons.

4. SURREY.—Death vacancy. New BUSINESS. Rapidly improving neighbourhood, about six miles from town. Returns at present about £6 per week. Good house and garden. Offer wanted.

5. LANCASHIRE.—Branch BUSINESS for disposal. Returns under management over £400; can easily be increased. Large house and good lease. Rent only £14 yearly. Price £250, or valuation.

6. KENT.—In a pretty locality. Nearly new BUSINESS for disposal through dissolution of partnership. Returns about £4 per week at present; increasing. Large double-fronted shop, well fitted and good stock. Very large and convenient house. Price about £300.

7. SOUTHERN COUNTY.—Capital opportunity for investment. Good reliable BUSINESS. Returns nearly £800. Full prices. Large garden, greenhouses, &c. Price £600, or valuation.

Other businesses, town and country. Particulars free on application.

VALUATIONS.

Terms for valuation on application.

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SPECIAL FOODS FOR INFANTS & INVALIDS

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They consist of—

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Containing all the digestive principles of the fresh pancreas. Used to prepare peptonised or partially digested food (no special apparatus required), and also medicinally as a digestive. In 4, 8, and 16 ounce Bottles, to retail at 2/6, 4/6, and 8/6.

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"The Liquor Pepticus prepared by Mr. Benger is a digestive agent of extraordinary power."—Dr. WM. ROBERTS, F.R.S., at *Norwich Meeting of British Medical Association.*

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A concentrated partially digested and solidified beef tea, of delicate flavour. Unlike the various Extracts and Essences of Meat, it contains much of the fibrin or flesh-forming element of the beef in solution. Tins, 2/.

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For Infants, Delicate Children, and Invalids. Containing the natural digestive principles of the pancreas; when mixed with warm milk a process equivalent to partial digestion takes place, by which both the food and milk are adapted for rapid absorption. In *no other food* has this result been obtained. It can therefore be taken with comfort when all others disagree. Tins, 1/6, 2/6, and 5/.

Benger's Preparations may be obtained through BARCLAY, EDWARDS, SANGER, SUTTON, NEWBERY, *and all the leading Wholesale Houses, or of the Manufacturers,*

MOTTERSHEAD & CO. (S. PAINE & F. B. BENGER),

PHARMACEUTICAL CHEMISTS, MANCHESTER.

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

THE JACOB BELL MEMORIAL SCHOLARSHIPS.*

TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the Lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships take place on the second Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

PRELIMINARY EXAMINATION.

This Examination will be held throughout Great Britain, at 11 a.m., on the **second Tuesday** in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

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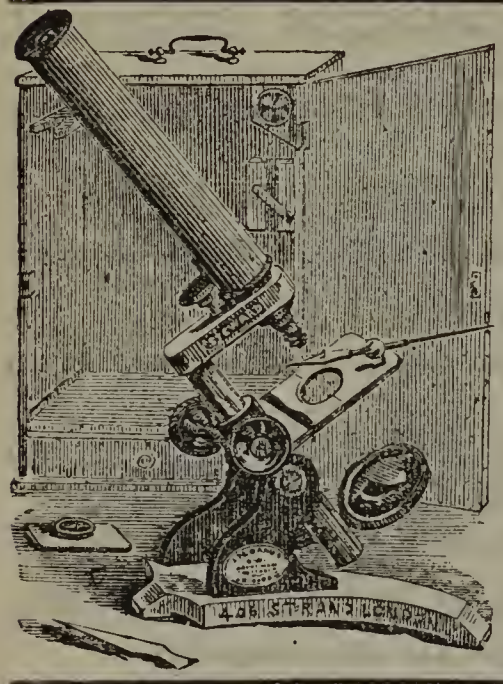

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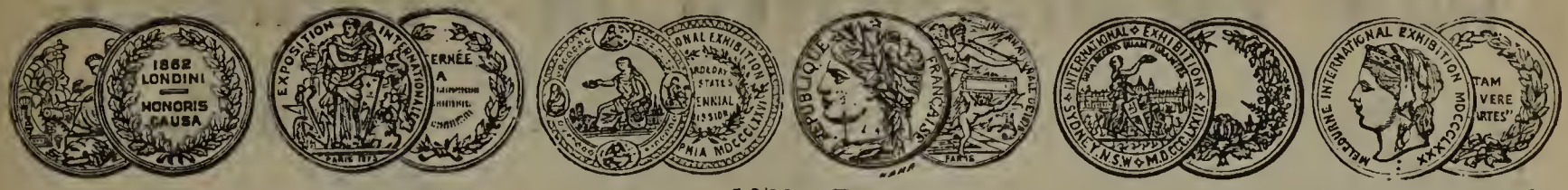

LONDON, 1862. PARIS, 1875. PHILADELPHIA, 1876. PARIS, 1878. SYDNEY, 1879. MELBOURNE, 1880.

KILNER BROTHERS

MANUFACTURERS OF

GLASS BOTTLES

VAN BOXES, CASES, &c.

Respectfully invite attention to the following Goods that they supply:

DISPENSING BOTTLES	**Green Flint.**—Flats, Ovals, Octagons, Rounds, Direct Squares. **White Flint.**—Vials—tall, medium, and squat series. Round Shoulders. Octagon, Homœopathic, Wide Mouth. **Blue Glass.**—Poisons—octagon and flat.	DISPENSING BOTTLES
FEEDING BOTTLES	"**Our Babies' Bottle,**" in green and white glass. "**Our Darlings' Bottle,**" in white glass. All with white, brown, or black fittings.	FEEDING BOTTLES
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CHEMISTS' BOTTLES	**Pale Green.**—Panel Flats, Salines. **Blue Glass.**—Citrate of Magnesia. **White Flint.**—Kalies, Rounds wide mouth, Marking Inks, Round Oils, Shop Rounds, Ether Rounds, Show Carboys, Syrups, &c., &c.	CHEMISTS' BOTTLES
SUNDRIES	**Glass.**—Measures—conical, cylindrical, cup bottom, tumbler, wine and minim. Funnels, Mortars and Pestles, Stirring Rods, Nipple Shells, Test Tubes, Eye Baths, Spirit Lamps, Sample Tubes, Tube Vials. **Earthenware.**—White Covered Pots—ordinary, thin, tall, and thick. Also labelled Cold Cream. **White Opal Glass.**—Covered Pots, ordinary. **Corks.**—A good selection of sizes and qualities. **Parcels Post Boxes**—to suit all Bottles.	SUNDRIES

Also Wholesale Druggists', Oil, Tap, Pickle, Sauce, Vinegar, Wine, Spirit, Beer, Mineral Water, Common and other Bottles, Syphons, Van Boxes, Cases, &c.

	NOTICE—WE PUBLISH	
FOR HOME TRADE	**Monthly.**—A 12-page Circular, containing full particulars of our goods, in which attention is invited to new kinds as they are added, and prominence given to goods in season. **Quarterly.**—Price Current of Dispensing, Feeding, Perfumery, and Chemists' Bottles and Sundries. **At Intervals.**—Price Lists of other Goods as mentioned above, in separate sections for different trades.	FOR HOME TRADE
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KILNER BROTHERS

No. 6a, Gt. Northern Goods Station, King's Cross, London.

NEW IMPROVEMENTS IN PHARMACY.

The Burroughs Inhaler

"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

Kepler Extract of Malt.

THE LANCET says of the Kepler Extract of Malt: "The best known, and in this country the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil." And further adds, "It is very good, and may be used with confidence."

McK. & R. Capsuled Pills.

An important improvement has been made, which now renders the most offensive and repulsive drugs easy of administration. This improvement consists in perfectly sealing with a thin transparent capsule of gelatine all drugs such as quinine, morphia, rhubarb, &c., also the various pills and powders of the Pharmacopœia. These capsules are of an ovoid shape, and it has been demonstrated beyond question that when ordinary coated pills are rejected by patients there is not the slightest difficulty in administering this new form.

Kepler Cod-Liver Oil with Extract of Malt.

This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

The Burroughs Beef and Iron Wine.

"This is a really valuable preparation, and, as far as we know, a novelty. It contains beef-juice and citrate of iron in solution in wine, and is therefore a very powerful and rapidly-acting tonic. Children, as well as adults, take it easily; and, as its taste is by no means unpleasant, it can hardly fail to attain great popularity."

Lawton's Absorbent Cotton

"Has been pronounced by some of our most eminent surgeons the very best absorbent for taking up discharges; it is very fine and soft, and acts instantly."—*The Medical Press and Circular.*

Hazeline.

Hazeline is distilled from the fresh green inner bark of Hamamelis Virginica, the American Witch Hazel. It represents, in a concentrated form, all the active principles of the plant. It is a clear, colourless fluid, having a fragrant, agreeable odour, and slightly astringent taste. Does not stain linen, and is entirely free from toxic or irritating properties.

The Wyeth Compressed Tablets

EXACT SIZE OF TABLET.

Of Chlorate of Potash and other drugs usually employed for throat affections. Chlorate of Potash with Borax; Chlorate of Potash with Chloride of Ammonium; Chloride of Ammonium with Borax, &c. The pure drug, without any addition, is compressed in very small lenticular discs, which are easily retained in the mouth while singing or speaking. The great advantage of these Tablets over the ordinary lozenges is, that they are free from the irritating saccharine matter with which ordinary lozenges are diluted. They are now almost universally prescribed by the profession in preference to the usual gargles, for when allowed to dissolve in the mouth the saliva becomes charged with the salt, carrying it directly to the affected parts, thus really securing all the beneficial effects of a continuous gargle without the injurious exertion which was required by the old method. Supplied in Packages at 1s., 2s. and 3s.

The Wyeth Soluble Compressed Hypodermic Tablets.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
Morphiæ Sulphas ....1-4 grain.	Atropiæ Sulphas .... 1-200 grain.
Morphiæ Sulphas ....1-6 grain.	Morphiæ Sulphas ....1-12 grain.
Morphiæ Sulphas ....1-8 grain.	Atropiæ Sulphas ....1-250 grain.
Morphiæ Sulphas ....1-12 grain.	Atropiæ Sulphas ....1-60 grain.
Morphiæ Sulphas ....1-3 grain.	Atropiæ Sulphas ....1-100 grain.
Atropiæ Sulphas ....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
Morphiæ Sulphas ....1-4 grain.	Strychniæ Sulphas ..1-60 grain.
Atropiæ Sulphas ....1-150 grain.	Strychniæ Sulphas ..1-100 grain.
Morphiæ Sulphas ....1-6 grain.	Strychniæ Sulphas ..1-150 grain.
Atropiæ Sulphas ....1-180 grain.	

The Wyeth Dialysed Iron.

1. It is easily administered, the dose being very small.
2. It has no unpleasant taste or smell.
3. It does not irritate the stomach.
4. It has no effect on the bowels, producing neither constipation nor diarrhœa.
5. It does not blacken the teeth.

In ordering please specify Fer. Wyeth 3 oz. with Dropper.

NOTE.

All the articles mentioned on this page may be obtained from respectable Dispensing Chemists and Wholesale Druggists in every part of the world, or from the European Depôt of Burroughs, Wellcome & Co., Snow Hill Buildings, London, E.C. Our new Formulæ Book and Trial Specimens of any of our Preparations will be sent to any Member of the Profession upon request.

Burroughs, Wellcome & Co. Manufacturing Chemists,

SNOW HILL BUILDINGS, LONDON, E.C.

THE VERDICT.

THE LANCET reports of the Kepler Extract of Malt: "*The best known*, and *in this country the largest used Extract of Malt.* It is as distinct an advance in therapeutics as was the introduction of cod liver oil.

Professor Yandall, M.D., of Louisville, U.S.A., reports of it:—"The Kepler Extract of Malt is the best, and has the finest flavour of any I have seen; it is a very valuable preparation."

"The Medical Times and Gazette" says of it:—"The Kepler Extract of Malt is deserving special commendation. It is, we venture to say, by far the best we have seen. *The one most widely known and most largely used in this country.*"

"The Medical Press and Circular" in reporting upon the subject says:—"The Kepler Extract of Malt is reliable, and is manufactured in such a careful manner as to ensure the preservation of its valuable constituents. It is very delicious to the taste, and has been found by analysis to be exceedingly rich in diastase, and consequently is a valuable digestive agent.

"The Kepler Malt, combined with Cod Liver Oil, is the most palatable and easily digested of any form we have yet seen for administering Cod Liver Oil."

Burroughs, Wellcome & Co., Manufacturing Chemists, Snow Hill Buildings, London, E.C.

ROBERT GIBSON,

MEDICATED LOZENGE MANUFACTURER,

CARLTON WORKS,

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No. 1, AUSTRALIAN AVENUE, LONDON.

ORIGINAL MAKER OF

GIBSON'S CHLORODYNE LOZENGES

CHLORODYNE JUJUBES, GLYCERINE PASTILLES,

DELECTABLE AND VOICE JUJUBES.

IN DECORATED TINS. TINS NOT CHARGED.

GIBSON'S ORIGINAL SUGAR WORM CAKES

Have an immense sale, both at home and abroad; will keep in any climate, and give universal satisfaction.

Put up in Tins containing 3 dozen, 6 dozen, or 12 dozen 1d. Cakes.

GIBSON'S BOILED SUGARS

Have gained a high reputation, both at home and abroad. Are made of the best Loaf Sugar, and are equal to, if not surpassing, all others.

PACKED IN CASKS OR CASES FOR EXPORT, DELIVERED FREE ON BOARD.

Carriage paid upon six 4-lb. Bottles to any part of England.

GIBSON'S COUGH DROPS, LIME FRUIT DROPS, AND ACID DROPS.

Especially Recommended.

THROAT HOSPITAL LOZENGES

(as per T. H. Pharmacopœia.)

All Lozenges are sent out in 2-lb. and 4-lb. Bottles (bottles free), but allowed for if returned.

Proprietary Lozenges carefully prepared, stamped, and cut to any size or shape.

PRICE LISTS SENT ON APPLICATION.

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COX'S TASTELESS PILLS

BY ROYAL LETTERS PATENT.

Dated and Sealed April 13th, 1854.

Surgeons and Chemists supplied with an excellent Aperient Pill (the formula for which will be forwarded), covered with a thin non-metallic film, rendering each Pill perfectly tasteless, at 1*s.* a gross. Postage free.

Any formulæ dispensed and covered, and samples, with list of pills, from 500 different forms, which are kept in stock, will be forwarded free on application.

They were introduced to the medical profession by the present proprietors a quarter of a century ago, and many thousands of unsolicited testimonials have been received from the highest medical authorities. These Pills are now used, and have been used for many years past, by the largest and best conducted hospitals and dispensaries. Of course, a success like this has led to many imitations, and highly-varnished pills, made to resemble ours, have been introduced by some unscrupulous people. Many of these pills pass through the stomach unaltered, and a useful invention is thus likely to be brought into disrepute.

The most impudent assertions are made by some of these people, who combine, in one incongruous whole, the trades of druggists' sundrymen, retail druggists, soap makers, and horse and cattle medicine vendors.

We make and sell nothing but pills, and have testimonials from regular customers, residing in China, Australia, and every part of the civilised world, as well as from friends in almost every town and village in the kingdom ; and our trade, which is constantly increasing, is perhaps four or five times as large as all the rest of our copyists put together.

The following are some of our Prices FOR CHEMISTS ONLY:

We strongly recommend our Aperient Pills as a good general saleable Pill. These, with the Pharmacopœia Pills quoted below, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received ; and, to avoid booking and other expenses, 1*d.* in the Shilling will be allowed if Stamps or P.O.O. are remitted with order.

Our Pills can also be obtained from any Wholesale Druggist. In ordering, please specify "Cox's Tasteless Pills."

QUOTATIONS FOR OTHER PILLS ON APPLICATION.

No. in Catalogue	Pil. Aperiens et Cathartic.	Prices per Pound in Four or Five Grain Pills.		No. in Catalogue	Pills of the British Pharmacopœia.	Prices per Pound in Four or Five Grain Pills.	
		Coated.	Uncoated.			Coated.	Uncoated.
1 & 2	Pil. Aper. (Cox) c. Cal.....	6/	5/	122	Pil. Asafœtidæ Co.	6/6	5/6
3 & 4	,, ,, (Cox) sine Cal...	6/	5/	66	,, Cambog. Co.	6/	5/
193	,, Cathartic Fort. (Cox).	6/	5/	24	,, Coloc. Co.	16/	15/
332	,, Cochia.....	5/	4/	30	,, ,, et Hyos	13/	12/
				62	,, Ferri Carb.	5/	4/
	Pills of the British Pharmacopœia.			71	,, Hydrarg.....	5/	4/
				92	,, ,, Subchlor. Co.....	6/6	5/6
				77	,, Ipecac. c. Scilla.....	7/	6/
6	Pil. Aloes Barb.	6/	5/	90	,, Plumbi c. Opio.	12/	11/
8	,, ,, et Asafœtidæ	5/	4/	104	,, Rhei Co.	7/	6/
9	,, ,, et Ferri.....	5/	4/	119	,, Saponis Co.....	12/	11/
10	,, ,, et Myrrh	12/	11/	321	,, Scammon. Co.	22/	21/
7	,, ,, Soc.	6/6	5/6	115	,, Scillæ Co.	5/	4/

The Registrar of Trade Marks (after giving the usual public notice, prescribed by Parliament, to allow of opposition) has granted us the above "Trade Mark," thus officially recognising us as the "*Original Makers of Tasteless Pills*," and no Pills will be sent out without this Mark on all bottles or packages.

ARTHUR H. COX & CO.

Tasteless Pill Manufacturers,

ST. MARTIN'S PLACE, BRIGHTON.

BISHOP'S
GRANULAR EFFERVESCENT SALTS

Established 1857.

The LANCET, writing of Bishop's Preparations, says:—"Their excellence is well known."
The BRITISH MEDICAL JOURNAL says:—"The name of Mr. Bishop is a sufficient guarantee that the article is skilfully prepared."

BISHOP'S
Granular Effervescent Citrate of Caffeine.

THE BEST KNOWN REMEDY FOR HEADACHE.

This Salt has been most extensively used as a remedy for sick headache, and with such great success, that it may almost be called a specific. It relieves all disorders of nerve-function, and is at the same time most cooling and refreshing.

BISHOP'S GRANULAR EFFERVESCENT CITRATE OF CAFFEINE is sold in bottles at 2*s.* 6*d.* each. With each bottle is supplied a wooden Measure Cup, which when filled, but not heaped, gives an exact dose. The Granular Effervescent Citrate of Caffeine should be taken at the commencement of an attack of headache, and the dose should be repeated in an hour if any pain should remain. Testimonials from the most eminent medical men in the profession enclosed with each bottle.

An eminent Birmingham Physician writes:—"I like the EFFERVESCENT CITRATE OF CAFFEINE prepared by Bishop very much. It is a particularly valuable medicine as a morning restorative; and after brain exhaustion, or where sedentary occupation have reduced the tone of the system, it may be taken with perfect safety and great advantage."

BISHOP'S
Granular Effervescent Citrate of Potash.

Contains eight grains of this anti-febrile salt in each drachm, keeps well, and yields a delicious effervescent draught. It is more efficient, more economical, and more convenient than the ordinary alkaline waters, and much superior to the various mixed powders, which consist mainly of Tartrate of Soda.

The late Mr. Fewtrell, Analytical Chemist, wrote:—"It is the nicest effervescing preparation I have ever tasted, and is infinitely pleasanter than the bottled waters."

Dr. G. O. DREWRY, in his "Common Sense Management of the Stomach," recommends for Indigestion, Constipation, &c., the "GRANULAR EFFERVESCENT CITRATE OF POTASH" as a very agreeable, mild, and cooling laxative, when taken in doses of one dessertspoonful in half-a-pint of water before breakfast.

BISHOP'S
Granular Effervescent Mineral Water Salts.

For the preparation of artificial waters, these Granular Effervescent Salts are especially suitable. They give a refreshing draught, and may be relied on as presenting at the same time the chemical ingredients of the natural waters. It is obvious that in this form the Granular Effervescent preparations present many advantages over the waters themselves. Whilst all the constituents of the natural springs are reproduced, the Salts are extremely portable, more economical, and with them a sparkling refreshing draught is procurable in any quantity at any time. Among the Mineral Water Salts thus prepared may be named, CARLSBAD, KISSINGEN, PULLNA, SELTZER, VICHY, LITHIA, FRIEDRICHSHALL, &c., &c. In each case a teaspoonful of the Salt in half-a-tumbler of water will produce a draught similar in effect to the natural water. The Seltzer Water has been long recognized, both in this country and in Europe, as an excellent tonic and mild aperient.

BISHOP'S
Granular Effervescent Citrate of Magnesia.

A perfectly white and delicately clean preparation, prepared from Salts obtained from the Pure Fruit Juices of Lemons and Grapes.

The best Chemists in Great Britain and the Colonies keep no other "Granular Effervescent Citrate of Magnesia" than "Bishop's." The reason for this universal preference is that, since its introduction in 1857, it has been found that none of the Imitations of this preparation, *originally introduced by Mr. Bishop*, have been able to compare with it in reliability as a medicine, or in *purity* and *freshness of flavour* as a *cooling drink*. Full directions on each bottle.

Sold in convenient sizes to suit the Buyer.

Report on Mr. Bishop's Granular Effervescent Preparations. By Prof. Attfield, Ph.D., F.R.S., F.I.C., F.C.S., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, Author of a Manual on General Medical and Pharmaceutical Chemistry.

Mr. Bishop's Granular Effervescent Preparations have been known to me for more than twenty years. The maker has submitted to me the formulæ for them; I have seen them compounded at his factory; I have more than once tested the materials he uses; I have many times analysed the finished products. The formulæ are excellent, the ingredients pure, the processes perfect, the products all that can be desired.

(Signed)

JOHN ATTFIELD.

London, Dec. 6, 1881.

Observe the Name on the Seal, the Registered Trade Mark on the Label, and full address of

ALFRED BISHOP, *Manufacturing Chymist,*
17, SPECK'S FIELDS, Mile End New Town, London.

Messrs. JOHN WYETH & BROTHER are Sole Agents in the United States for Mr. Bishop's Preparations, and keep Stock of all the above Products.

THE BEST
TEMPERANCE BEVERAGE

THE MONTSERRAT COMPANY LIMITED · PALMAM QUI MERUIT FERAT · LIME-FRUIT PREPARATIONS
TRADE MARK.

'MONTSERRAT'

THE MONTSERRAT COMPANY LIMITED · PALMAM QUI MERUIT FERAT · LIME-FRUIT PREPARATIONS
TRADE MARK.

Either alone or with the addition of Simple Syrup, which can be obtained from any Chemist, and mixed with Water or Soda Water and a little Ice, if obtainable, one of the most delicious drinks can be made, but care should be taken that "MONTSERRAT" LIME-FRUIT JUICE only is used, as it has the delicate aroma and flavour peculiar to the Lime Fruit and found in no other Lime Juice.

THE LANCET SAYS:—"We counsel the public to drink their Lime Juice whenever and wherever they list. As a rule, Lime Juice is, particularly during the summer, a far more wholesome drink than any form of alcohol. We have subjected the samples of the 'Lime-Fruit Juice' of the Montserrat Company to full analysis, with a view to test its quality and purity. WE HAVE FOUND IT TO BE IN SOUND CONDITION, AND ENTIRELY FREE FROM ADULTERATION."

Many other refreshing Drinks can be produced with the "MONTSERRAT" LIME-FRUIT CORDIALS—a list of which follow:—

Limetta, or Pure Lime Juice Cordial,
AROMATIC, CLOVE, STRAWBERRY, RASPBERRY, SARSAPARILLA, PINEAPPLE, JARGONELLE, PEPPERMINT, QUININE.

Can be obtained from any Druggist throughout the World.

NOTICE TO THE TRADE.

A large Handbill, similar to above, and handsome Show Card supplied to any Chemist stocking the Montserrat Lime Juice, &c.

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THE CHEMISTS'
Aerated and Mineral Waters Association,
LIMITED.

LONDON, *45, Gifford Street, Caledonian Road, N.*

BRISTOL, & HARROGATE, *Sun Factory, Victoria Road.* *Montpellier Works Starbeck.*

This being the ONLY Company that supplies *exclusively* to *Hospitals and Chemists* Manufactured Mineral Waters of the highest class and of specified formula, the Directors beg to hand you at foot prices for same in Bottles and Syphons, and trust to be favoured with a sample order.

	Bottles. Per Doz.	*Syphons.*
Carbonated Water	at 1/-	1/6
Soda „ 5 Grains to ½ pint	„ 1/-	1/6
Soda „ B.P., 15 „ „	„ 1/-	1/6
Potash „ 5 „ „	„ 1/-	1/6
Potash „ B.P., 15 „ „	„ 1/-	1/6
Seltzer „	„ 1/-	2/-
Lemonade	„ 1/3	
Lime Juice	„ 1/3	
Ginger Ale	„ 1/3	2/6
Ginger Beer, Glass	„ 1/3	
Lithia, B.P., 5 Grains to ½ pint	„ 1/9	
Iron and Quinine Water	„ 1/9	
Mineral Acid	„ 1/9	

Bottles, at per doz., 1/6. **Syphons** at 24/-. **Cases**, 3 doz., 3/6; 4 doz., 4/6; 6 doz., 5/6. **Syphon Cases**, 2/6.

Sparkling Rubine and **Sparkling Limine**, pints, at 3/2 per doz., bottles included. 6 doz. at 3/-, and 30 doz. at 2/10. Special terms for 5 gross and upwards bottled goods. **Natural Mineral Water** supplied at 10 per cent. off list prices. For further particulars apply to

H. T. BUTLER, *Secretary.*

BINGLEY'S SUPERIOR GINGER ALE,
An Aromatic & Non-Intoxicating Stimulant,

Manufactured by a Special Process worked out by the Proprietor, by means of which the *aromatic* properties and *true* delicate flavour of *Jamaica* Ginger are fully retained. It is confidently offered as a very superior article.

The following are a few of the opinions which have been expressed in reference to

BINGLEY'S GINGER ALE.

"**The Chemist & Druggist**" of January 15, 1883, in an article on "GINGER ALE," says, speaking of the Ginger Ale manufactured by Mr. BINGLEY, of Northampton:—"We are bound to report most favourably. Very few makers have succeeded in so perfectly presenting the odour and aroma of Jamaica Ginger in a clear, bright, sparkling beverage."

"**The Midland Medical Miscellany**" of August, 1883, in a note referring to BINGLEY'S AERATED WATERS, says:—We are particularly pleased with the Ginger Ale, which, as is not always the case, really presents the flavour of Ginger."

The following are a few of the opinions expressed by Chemists and others:—

"Excellent in every way."

"I like the Ginger Ale very much."

"We have tasted the Ginger Ale and like it very much; indeed, it is the best thing of its kind we have met with."

"We have received the case of Ginger Ale, and have tasted a bottle with one of . . . We think that your article has the advantage in point of delicacy of flavour."

"Having carefully tasted the Ginger Ale you were good enough to send me, and also submitted it to the judgment of a friend in the trade, I can speak of it advisedly in terms of high commendation. The aroma is very fine, and the full, generous warmth in the mouth is as near perfection as possible."

"I will write you about the Ginger Ale; it is first rate."

"The sample of Ginger Ale you were good enough to send me appears exceedingly good, and I shall be glad if you will send me one case at your convenience."

"Capital stuff is this Ginger Ale."

"Your Ginger Ale is excellent, and I shall be very glad if you will send me a case."

"Your sample of Ginger Ale is everything that can be desired. The fine flavour of the Ginger alone shows the care with which the essence has been prepared; it will certainly command a line in my next order."

"I have received the sample of Ginger Ale, and beg to state that it is the best I have ever tasted."

"I am pleased to say that so far the customers we have supplied with your Ginger Ale have been very pleased with the same."

"Your Ginger Ale is very delicious."

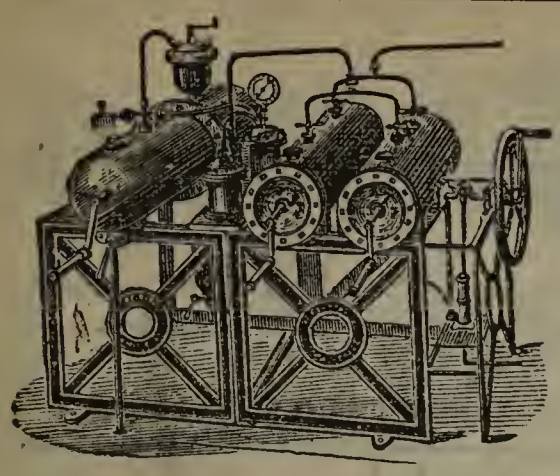
"The Ginger Ale arrived a week ago; I think it is very nice indeed."

"I certainly have not yet tasted anything to touch it."

MANUFACTURED BY

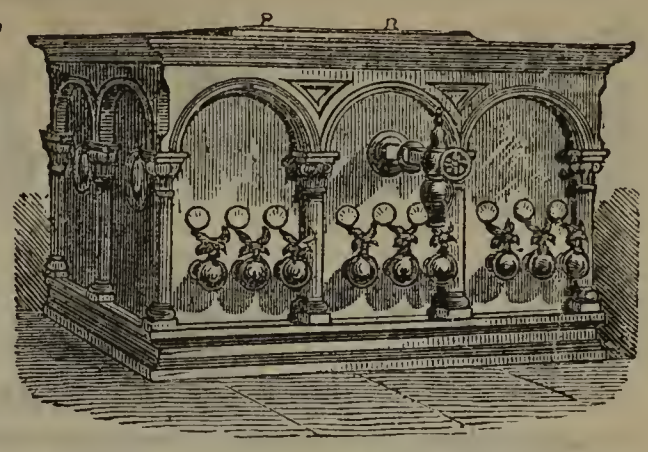
JOHN BINGLEY, Analytical Chemist, NORTHAMPTON.

Samples for Home or Export free on application.



TRADE MARK.

Paris	... ...	1867
Havre	... ...	1868
Amsterdam	...	1869
St. Petersburg		1870
Cassel	... ...	1870
Kensington	...	1871-2
Vienna	... ...	1873



TRADE MARK.

ICE DRINK FOUNTAINS.
SODA WATER MACHINES.

The most economical Outfit Manufactured. Simple! Durable!! Effective!!! Every Chemist should have one.

GOLD MEDAL.

The only Gold Medal awarded at the Vienna Exhibition for Improvements in Mineral Waters and Soda Water Machinery in competition with Manufacturers from all parts of the World.

Fruit Juices. Essences. Extracts. Syrups. Lime Juice Cordial. Ice Cream Freezers. Ice Safes. Gum Extract for Producing Foam. Every Requisite connected with the Trade.

Outfits of various Sizes, Styles, and Prices. Send for Catalogues (Illustrated) and Price Lists, Post Free, to

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FOR MACHINERY, FOUNTAINS, &c.

NATURAL BITTER WATER OF FRIEDRICHSHALL.

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GUARANTEED PURE SOLUBLE COCOA, of the finest quality, without Sugar or admixture.

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Four times the strength of Cocoas thickened, yet weakened with Arrowroot, Starch, &c., and in reality cheaper.

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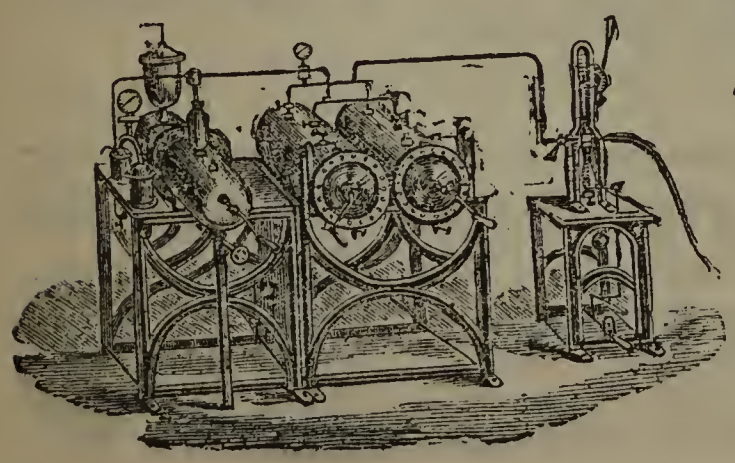

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

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A POSITIVE CURE FOR STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

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ZOEDONE

The ZOEDONE COMPANY have much pleasure in informing the trade that they have been able to effect important improvements in the manufacture and flavour of Zoedone.

In order to popularize it and place it within the reach of everyone, it is now (in addition to being put up in champagne bottles as heretofore) also put up in ordinary mineral water bottles and supplied to the trade on such favourable terms as will enable them to retail it at the same price as lemonade.

Bottling agents (who supply on wholesale terms) have been appointed in most of the principal towns in the United Kingdom. A list of these agents will be forwarded on application.

Applications for such agencies are invited for those districts which are not yet represented.

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W. G. CARR & SONS, Pharmaceutical Chemists,

IMPORTERS AND MANUFACTURERS OF COD LIVER OIL,

BERWICK-ON-TWEED.

ESTABLISHED 1794.

AWARDED SIX GOLD AND SILVER MEDALS.

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Importers and Bottlers to the Trade,

Have on Sale one of the Largest Stocks in London from which regular qualities can always be relied on.

PRICE LISTS AND SAMPLES ON APPLICATION.

NEW LICENSES.

As the law at present is, the Justices have no discretion, but to grant license certificates to all respectable persons applying for them, enabling them to obtain the excise licenses for the sale of wines and spirits for consumption off the premises. Attempts are continually being made in Parliament to alter this law with a view to stop the issue of these licenses. If successful, a valuable MONOPOLY will be created for those who are already licensed.

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N 2

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DR. J. COLLIS BROWNE'S CHLORODYNE

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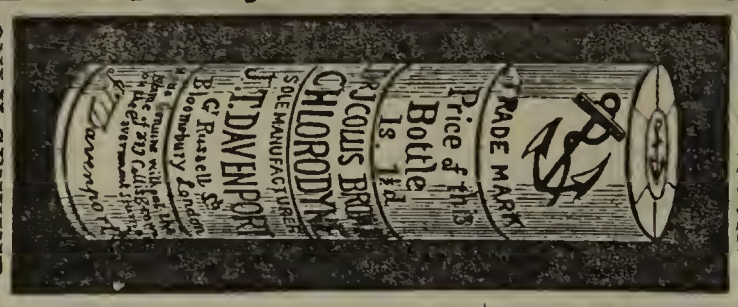

IS THE GREAT SPECIFIC FOR CHOLERA, DIARRHŒA, DYSENTERY.

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DR. J. COLLIS BROWNE'S CHLORODYNE.—Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY to denote which he coined the word CHLORODYNE. Dr. Browne is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

DIARRHŒA, DYSENTERY.

GENERAL BOARD of HEALTH, London, REPORT that it ACTS as a CHARM, one dose generally sufficient.

Dr. GIBBON, Army Medical Staff, Calcutta, states: "2 DOSES COMPLETELY CURED ME of DIARRHŒA."

From SYMES & Co., Pharmaceutical Chemists, Simla. *Jan.* 5, 1880.

To J. T. DAVENPORT, London.

DEAR SIR,—We congratulate you upon the widespread reputation this justly-esteemed medicine has earned for itself all over the East. As a remedy of general utility, we much question whether a better is imported, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances *ad infinitum* of the extraordinary efficacy of DR. COLLIS BROWNE'S CHLORODYNE in Diarrhœa and Dysentery, Spasms, Cramps, Neuralgia the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than Collis Browne's, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than Collis Browne's is a deliberate breach of faith on the part of the chemist to prescriber and patient alike.—We are, Sir, faithfully yours, SYMES & CO., *Members of the Pharm. Society of Great Britain, His Excellency the Viceroy's Chemists.*

DR. J. COLLIS BROWNE'S CHLORODYNE is the TRUE PALLIATIVE in NEURALGIA, GOUT, CANCER, TOOTHACHE, RHEUMATISM.

DR. J. COLLIS BROWNE'S CHLORODYNE is a liquid medicine which assuages PAIN of EVERY KIND, affords a calm, refreshing sleep WITHOUT HEADACHE, and INVIGORATES the nervous system when exhausted.

DR. J. COLLIS BROWNE'S CHLORODYNE rapidly cuts short all attacks of EPILEPSY, SPASMS, COLIC, PALPITATION, HYSTERIA.

IMPORTANT CAUTION.—The IMMENSE SALE of this REMEDY has given rise to many UNSCRUPULOUS IMITATIONS. Be careful to observe Trade Mark. Of all Chemists. 1s. 1½d., 2s. 9d., and 4s. 6d.

SOLE MANUFACTURER,
J. T. DAVENPORT, 33 Gt. Russell St., W.C.

THE ORIGINAL AND ONLY GENUINE.

IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

Apothecaries' Hall	London.	Gale & Co.	London.	Morson, T., & Son,	London.
Allen, Hanbury & Co.	,,	Giles & Son,	Clifton.	Newbery & Sons,	,,
Baiss Brothers,	,,	Goulding, Messrs.	Cork.	Oldham, G., & Co.	Dublin.
Banks & Richards,	Birmingham.	Grattan & Co.	Belfast.	Parsons & Richardson,	Leicester.
Barron, Harveys & Co.	London.	Grimwade, Ridley,	London.	Peake, Allen & Co.	Dublin.
Bell, John & Co.	,,	Grindley & Son,	Chester.	Raimes & Co.	Liverpool.
Corbyn & Co.	,,	Hearon, M'Culloch & Co.	London.	Sang & Barker,	Edinburgh.
Cox & Gould,	,,	Hodgkinson, Tonge & Stead,	,,	Sanger, J., & Sons,	London.
Curling & Co.	,,	Hopkins & Williams,	,,	Sim, James, & Co.	Aberdeen.
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Drew, B., & Alexander,	,,	Langton, W., & Co.	London.	Sutton, W., & Co.	London.
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Evans, Lescher & Webb,	,,	Mander, Weaver,	Wolverhampton.	Westwood & Hopkins,	,,
Ferris & Co.	Bristol.	Marsden & Sons,	London.	Woolley, James,	Manchester.
Foulger, S., & Son	London.	Maw & Son,	,,	Wyleys & Brown,	Coventry.
Frazer & Green	Glasgow.	Meggeson & Co.	,,	Yates & Co.	London.

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith, unjust to patient and physician. The *value* of the remedy *alone* creates the great demand.

Sold in Bottles—1s. 1½d., 2s. 9d., 4s. 6d., and 11s. Usual Discount to the Profession.

SOLE MANUFACTURER,

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BOURNE, JOHNSON & LATIMER

Direct SPECIAL ATTENTION to a few of their most saleable Goods for the present Season. Chemists who wish to increase their returns, who have not seen these Goods, are invited to make up a small sample order, as they are "having a run."

The New Night Lamp and Food Warmer

Is the cheapest Lamp ever offered to the Public.

Price 22/- per doz.

Consumes about a Pennyworth of Petroleum Oil per week.

The New Earthenware Inhaler,

With Burnt-in Directions for Use.

Price 18/- per doz.

The only one that can be sold at 2/6.

Chlorate of Potash Pearls.

One dozen in a Glass Top Box, 4/- per dozen.

Glass Throat Spray

With Indiarubber Ball and Tube.

Price 27/- per doz.

The Ladies' Sanitary Pad.

(Absorbent Cotton Wool.)

Per gross, 14/- ; Retail at 2/- per doz.

The Ladies' Calendar Belt,

Suitable for using with above. Per doz. 14/-

These only need an introduction to secure a permanent sale.

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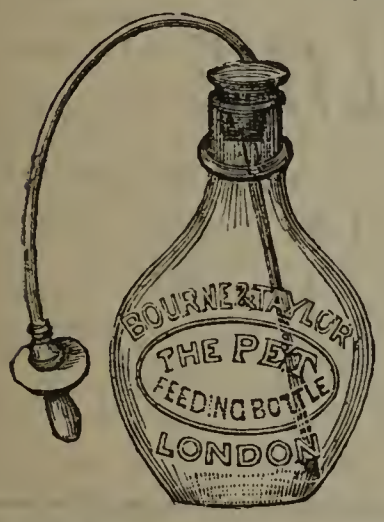
In Paper Cases, per doz., 4/- ; in Nickel-plated Pots, per doz., 8/-

Filled Watch-Shape Smelling Bottles.

English Stoppered Bottles, per doz., 4/-, 7/-



THE "PET" FEEDING BOTTLE

Is made in a variety of styles, the most saleable of which are the

No. 6	Bent Neck, with Wood Top Cork, White Fittings	per doz.	3/6
„ 7	„ „ „ Black „	„	3/9
„ 10	„ Screw Glass Stopper, White „	„	4/–
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„ 17	„ Screw Glass Stopper, White Flint, Black Fittings	„	8/–
„ 19	„ „ Metal Caps „ „	„	8/–
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SPECIAL QUOTATIONS TO LARGE BUYERS.

Japanese "Curl" Papers ... ... 4/- doz.
„ Sanitary „ ... ... 8/- „
Antiseptic Respirators, as Dr. Coghills, 16/- „

Pumice Stone Soap Tablets.

3 doz. in a Counter Box.
Per doz., 1/6.

All the above Goods bear a very good profit, and are specially recommended as being very saleable.

10 PER CENT. FOR CASH.

Having extended our Premises by the addition of the adjoining Warehouse, we are prepared to execute all orders promptly. We invite attention to our Show Rooms, and shall be glad to be favoured with a visit from our Country Friends.

BOURNE, JOHNSON & LATIMER

(SUCCESSORS TO BOURNE & TAYLOR),

WHOLESALE AND EXPORT DRUGGISTS' SUNDRIESMEN,

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PETROLEUM JELLY.

REGISTERED

"VASELINE"

TRADE MARK.

With increased facilities for Manufacturing, we are enabled to offer WHITE VASELINE and PERFUMED WHITE VASELINE, in the following packages,

AT GREATLY REDUCED PRICES

"WHITE VASELINE"

In Collapsible Tubes	1 dozen in box, -/9 each,	6/- per doz.
In 2-oz. Bottles, Cardboard Cases, No. 1 size ...	1 dozen in box, 1/- „	8/- „
In 5-oz. Bottles, Cardboard Cases, No. 2 size ...	½ dozen in box, 2/- „	16/- „
1-lb. Tins, 1/9 per lb.	5-lb. Tins, 1/6 per lb.	

"PERFUMED WHITE VASELINE"

In Collapsible Tubes	1 dozen in box, 1/- each,	8/- per doz.
In 2-oz. Bottles, Cardboard Cases, No. 1 size ...	1 dozen in box, 1/6 „	12/- „
In 5-oz. Bottles, Cardboard Cases, No. 2 size ...	½ dozen in box, 2/6 „	20/- „
In Bottles with Glass Stoppers, superior style of package, our Present "Pomade No. 3" ...	½ dozen in box, 3/6 „	28/- „
1-lb. Tins, 3/- per lb.	5-lb. Tins, 2/6 per lb.	

CAUTION.—The Trade are cautioned that the word "VASELINE" is the Registered Trade Mark of this Company for all their Emollient, Remedial, and other Preparations of Petroleum.

CHESEBROUGH MANUFACTURING CO. (New York)

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Sole Proprietors and Manufacturers of the "Vaseline" Preparations

PRICE LISTS POST FREE.

THE ANNUAL DINNER.

The Annual Dinner of the Pharmaceutical Society took place on Tuesday evening at the Holborn Restaurant, Mr. Michael Carteighe, President, in the chair. About 200 members and their friends attended, and there seemed to be but one opinion as to the excellent character of the dinner, the wine, and all the arrangements. Amongst the guests were Dr. Farquharson, M.P.; Dr. Lyons, M.P.; Sir Trevor Lawrence, M.P.; Mr. Daniel Grant, M.P.; Mr. W. Mc Cullagh Torrens, M.P.; Lieut.-Colonel Cowan (Sheriff of London and Middlesex); the President of the Medical and Chirurgical Society (Dr. George Johnson); the Secretary of the Royal Society (Professor Michael Foster); the President of the Odontological Society (Mr. T. J. Smith); the President of the Medical Society (Mr. Durham); the President of the Metropolitan Branch of the British Medical Association (Dr. C. J. Hare); the Dean of the College of Preceptors (Mr. H. W. Eve); the President of the Harveian Society (Mr. G. P. Field); the President of the Chemical Society (Dr. Perkin); the President of the Chemists' Assistants' Association (Mr. C. Parkinson); Sir Frederick Abel, Professor W. Chandler Roberts, Dr. Meymott Tidy, Dr. Lush, Dr. Stevenson, Dr. Hubbard, Dr. B. W. Richardson, Mr. E. Wyndham Cottle, Dr. Dowse, Mr. William Sowerby, Mr. H. J. Chaney (Standards Department), Mr. F. C. Danvers (Indian Office), etc.

The PRESIDENT first proposed the health of the Queen, which was received in the usual loyal and enthusiastic manner.

The next toast was "The Houses of Parliament," proposed by the PRESIDENT, who remarked that its importance was such as would allow of a very long speech if other considerations did not interfere. As far as he could see the members of the Legislature were judged from a very different standpoint inside the House to that from which they were judged outside. He had had on various occasions to see them within the precincts of the House, and he found them a very agreeable set of persons, who led a life which must be more or less horrible according to circumstances; and this impression of their lot was very much what he had experienced in some of his holiday wanderings in Switzerland, and reminded him of what was once said of a distinguished member of the literary profession and also of the Alpine Club, Mr. Leslie Stephen. That gentleman was once told by the prince of Swiss guides that it seemed a very remarkable thing that so many English gentlemen should go to Switzerland, leaving their comfortable homes and beautiful pastures, not to sit still and enjoy themselves, but to climb mountains, and to *pay* for the luxury of so doing. It seemed to him that the members of the House of Commons were very much in the position of an average Swiss mountaineer. They had an enormous deal of work to do; an immense responsibility; and in these days they had to pay heavily for the privilege of bearing these burdens. He looked upon a member of the House of Commons who did his duty as being a pattern to his countrymen; and, with regard to the House of Lords, in his opinion the two Houses were inseparable, and though they were not in the habit of inviting members of the Upper House to attend their annual meeting, none the less did those who took an interest in politics recognize the importance of that assembly. A second chamber was recognized by all who had given any thought to the questions of government to be essential, and both Liberals and Conservatives were, he believed, agreed on this point. Considering the amount of work which was done in Parliament and elsewhere by the members, he thought their constituents ought to feel greatly indebted to them. Everyone who had held office in any society or corporation knew perfectly well the enormous demands it made on their time, and considering that the House of Commons in itself represented almost everything between the smallest club and the largest corporation in the world, one might well wonder that it had not found it impossible to go on with the work which lay before it. If anyone felt inclined to complain of the paucity of the work which was done, he should remember that those outside were constantly clamouring for more and more to be undertaken. In proportion as civilization and education advanced so must the labours of Parliament increase. If, therefore, they complained that the House of Commons talked much and did little it must be borne in mind that the constituencies were in great part to blame, inasmuch as their wants were immeasurably greater than they were even twenty years ago. Although in that assembly any question of party politics would be quite out of place it was important to remember that for all practical purposes they lived under what was practically a republic. They had all the advantages of a republic with none of its disadvantages, and if the House of Commons or the House of Lords did not altogether represent what such houses should be it was due rather to the increased exigences of the country than to any fault in the Houses themselves. He would couple with the toast the name of a distinguished member of the medical profession, Dr. Lyons, Member for the City of Dublin.

Dr. LYONS, M.P., in responding, said he was called upon not only to reply for the House of which he had the honour to be a member, but also for the House of Lords, and he was, therefore, glad to see around him, and, no doubt, ready to make up for shortcomings on hi part, several distinguished members of the Legislature. There were an hon. baronet, who represented the medic profession, the hon. member for West Aberdeenshire, Dr. Farquaharson, and the hon. member who represented a division of the City of London; there was also a compatriot of his, who had for many years filled a distinguished position in the Legislature, who represented an important metropolitan constituency. The President had very ably depicted the labour which devolved upon them in the present day, and he felt that he was justified in saying that that labour was becoming more and more arduous every year. So much was the public business of the country increasing, and so much was it the custom of all, under all circumstances, to look to those who represented them in Parliament for assistance in dealing with almost every conceivable question which could occupy the human mind, that no one who had not gone through the labour of the House of Commons could thoroughly appreciate how thoroughly they were occupied from morning to night. To keep abreast, even in a moderate degree, with the various questions which agitated the public mind, and on which every member

was expected to be at least somewhat informed, was no slight task. Then they were obliged, though with pleasure and advantage to themselves, to see a number of persons representing important public interests, and from that constant contact with persons of the highest intelligence, representing commerce, industry and all branches of science and the arts, they derived most important advantages. In this way they were kept in constant touch with the community, and thus they endeavoured to fulfil the arduous duties which were imposed upon them, and which occupied them the greater part of the day and night. It was no longer a question of a sort of dilettante attendance on what had been called one of the best clubs in Europe, which no doubt it was, but it was also the most hard worked body in Europe that could be named. In order to secure the respect of those who came to see them on matters of public interest, they were obliged to steal from the hours usually allotted to sleep the time requisite to study those questions, and he believed it might be fairly said that an increasing proportion of members of the House of Commons were prepared to devote themselves heart and soul to the great business of the State. Much was done by those whose names became familiar in the daily papers as taking part in the debates, but much more was done of an important character by those who did silent work on committees. It was always a satisfaction to those who devoted themselves to public work to find that their efforts were appreciated, and it was a great pleasure, therefore, to him to find that this toast had been so heartily received.

The PRESIDENT next proposed "The Sheriffs of London and Middlesex." It was said that the office of Sheriff was more ancient than that of the Lord Mayor of London, but be that as it might, they were all delighted to see the right eye of the Lord Mayor,—as the Sheriff had been called,—present that evening. It was impossible to propose this toast without some reference to the corporation of London. Those who had not taken an active part in municipal affairs had some difficulty in grasping the pros and cons of the proposal now before Parliament with regard to what might be called the enlargement of the municipal boundary, but it did seem to him, speaking without any feeling of partizanship, that it pointed to a process by which all the traditions of the ancient city of London might be extended to a greater London without getting rid of them altogether. Living, as he did, outside of the City, he should be very sorry to ask the Lord Mayor and Sheriffs to come and assist those who did public duty in his neighbourhood, and at the same time to sacrifice in any way the ancient glories of their office. The difficulties of the question were very great, but above all things they should desire, while seeking to make progress in local self-government not to lose sight of those glorious traditions which belonged to the City of London and which sprang from the time when freedom was almost crushed by the royal prerogative. It was an extraordinary sign of the times that the City should be considered old fashioned and obstructive, because it carried out the form of government which was strenuously insisted upon as the preservative of freedom many hundred years ago. He would couple with the toast, the name of Lieut.-Colonel Cowan, and he would add a hope that he and his successors would all be imbued with the same desire to do justice to their fellow citizens as had animated their predecessors.

Sheriff Lieut.-Colonel COWAN thanked the meeting for the very kind way in which it had received the toast so flatteringly proposed by the President. Under ordinary circumstances he should not have departed from the rule he generally observed, not to make any allusion to political questions, but one or two remarks had been made which seemed to invite comment, with regard to the ancient municipality which he had the honour to represent. The corporation of London had existed for many years, and had been the personification of that local government and self-government under which England had prospered. As to the remark made with regard to the extension of the corporation in such a way that its ancient privileges might be extended to the more distant parts of the metropolis, he would remind his hearers that the word "local" had some limitation, and that the interest which had prompted the citizens of London to take such a lively interest in the welfare and improvement of their own surroundings could not be felt if those surroundings were extended to the vast area contemplated by the present measure. Having said so much he would only add that he thanked them very cordially for the honour which had been paid to the ancient office which he had the honour humbly to fill.

The PRESIDENT next proposed "The Learned Scientific Societies." He said the members of the Pharmaceutical Society from their early training were probably as well able to judge of the work which these societies did for the benefit of mankind as any other portion of the British public, and he held that no toast was received in a company of pharmacists with more enthusiasm. That was hardly the occasion to say much about science, but he might be allowed to remark that one of the objects of the Society which he represented as President was in a humble way to promote science in its relation to pharmacy; and that being so they naturally felt they should be doing wrong if they did not pay a tribute to the excellent work which was being done by all the great scientific societies for the benefit of mankind in general. There were present members of several learned societies, and it was rather difficult to select one in particular, but as a pharmacist he naturally turned to medicine, which had sent to the Royal Society, the father of all the learned societies, a number of distinguished men. In that spirit he proposed the toast, and associated with it the name of a distinguished professor of King's College, a Fellow of the Royal Society, a practical physician, and the President of the Medical and Chirurgical Society, Dr. George Johnson.

Dr. GEORGE JOHNSON said if he had any pride in his composition he should have begun by saying that he was very proud to respond to this toast, but as he was notoriously anything but proud he would begin by saying that he regretted exceedingly that the responsibility of responding had not fallen upon somebody better able to do justice to it. He saw around him many distinguished Fellows of the Royal Society, but he had been probably selected as being President of the Medical and Chirurgical Society. The learned and scientific societies were very numerous; he had the honour to belong to the oldest of them, and had been present at the birth of some of the youngest, and they were all doing very good work, endeavouring in various ways to extend the boundaries of human knowledge, to increase that knowledge which, in the words of Bacon, might tend to the glory of the Creator of man's estate. Amongst the sciences which were being cultivated by those societies, that of chemistry had conferred upon mankind greater

benefit than almost any other, and with that science most of the gentlemen present were connected. He had a great respect for the science which had lit that room by electricity instead of the abominable gas which poisoned the atmosphere, but by far the more important was the science which had given them two most beneficial agents, although their application was due to men of his own profession, viz., anæsthetics and antiseptics. These two were about the most beneficent agents which chemistry had brought to light. If it were not considered too medical he would venture to repeat what he had heard a few days since at a branch meeting of the British Medical Society at Colchester. At that meeting Mr. Thornton showed four remarkable specimens, two of them were urinary calculi, which he had removed from patients who were perfectly well after the operation,—not from the bladder, but from the kidneys, this being quite a modern operation; the third specimen was a spleen which had undergone hopeless degeneration, which had also been removed, and the patient was doing perfectly well. But the fourth specimen was still more remarkable. A young woman was found to have a tumour in the abdomen; first it was supposed to be in the colon; this was opened under the influence, of course, of anæsthetics, and the tumour was then found to be in the stomach. The stomach was then opened, and a concrete mass of hair was removed. It appeared that this person had been in the habit of swallowing the combings of her own hair, and the result was she had a solid cast of the interior of the stomach, which Mr. Thornton removed, stitched up the stomach again, and the patient perfectly recovered. He could not give a better practical illustration of what he had said, for without the use of anæsthetics such operations would be impossible, and without antiseptics the result of opening the stomach must have been fatal. Whatever happened, therefore, the name of his distinguished friend and colleague, Sir Joseph Lister, would be handed down to posterity as one of the greatest benefactors to the human race. Amongst the learned and scientific societies, the Pharmaceutical Society of Great Britain was doing as great an amount of beneficent work as any, and he would take that opportunity of expressing his thanks to the members for the very great help which on many occasions he had received from them. They knew that doctors sometimes made mistakes in writing prescriptions; sometimes, unfortunately, they left out the water, and sometimes prescribed ½ dr. of morphia for a dose instead of ½ dr. of the solution, and they were very much gratified by the polite way in which these mistakes were corrected without exposing their errors to the patient.

The Vice-President proposed the next toast, "The Medical Profession." He said the goal of human search, so moralists told us, was happiness; happiness was intimately associated with and dependent upon health; it was the special function of the medical man by wise sanitation to preserve that health and when it was lost to restore it. The profession of medicine was a truly noble one, if its function were considered as thus delineated and it was remembered what perennial powers a man required to win a place in the first rank—to be endowed with talent amounting almost to genius, and then to consecrate to his profession the noblest powers of mind and heart. He must give long, deliberate and anxious preparation for his professional life, and when that curriculum was finished and he came forth to enter on the duties of his career his attention could in no wise be relaxed. Whether they considered the delicate machine he had to deal with, the masterpiece of the great Creator, or considered that he had to deal with both mind and body, it must be admitted that he was called to a truly beneficent profession, and where in the wide world could this toast be more enthusiastically received than in the centre of light and leading, in the centre of this great metropolis? Within his own time there had been marvellous advances and discoveries in medicine, and it was now scarcely an exaggeration to say that there was not an organ or function of the human body which had not its specialist, and he ventured to think that not only was that a fitting place for such a toast, but that no body of men could more cordially propose it than pharmacists, for they trusted they were not presuming when they desired to be acknowledged as belonging, however humbly, to the medical profession. Sometimes the relations between pharmacy and medicine had been somewhat strained; they had had free lances amongst them; but he could honestly say that the *rôle* of the Pharmaceutical Society had been from its earliest days to discourage encroachments on the medical profession. He did not believe in a scientific frontier, or in strict lines of delimitation by Act of Parliament, but in that which was much better and nobler, the respect and confidence which honourable men should bear one for another. They desired to protect their own rights, but at the same time to repress any poaching on other men's manors, and if amongst their ranks men had sometimes claimed that which they did not possess, or if they possessed had no legal right to make use of, it was pre-eminently the function of the Pharmaceutical Society to discountenance such proceedings. He begged to couple with the toast the name of Mr. A. E. Durham, President of the Medical Society.

Mr. A. E. Durham, in responding on behalf of the medical profession, could say most truthfully and honestly that the medical profession at large, the best and largest part of it, thoroughly appreciated how much they owed to the pharmacists of this country. An after-dinner speech was no time for argumentation and discussion, but was a very good time indeed to express personal feelings, particularly after such a good dinner as they had had on the present occasion, when they naturally felt very cordial towards each other. He would not enter on any kind of discussion as to the relative position of pharmacists and doctors, but he did feel it was thoroughly right on the part of the medical profession to express their obligations to pharmacists. Something like thirty years ago, when he was going up for his examination at the University of London, he was in a little difficulty, because he knew he had to be examined about drugs and pharmaceutical preparations, and where he was studying he felt that the preparations were bad and the drugs rotten. It then occurred to him that possibly if he went to the Pharmaceutical Society's house, in Bloomsbury Square, although he was unknown and wanted introduction, he might have an opportunity of seeing what drugs and preparations ought to be like, and so he went; he was met in the most friendly manner possible, was shown everything he wanted to see, and was told he might come as often as he liked. That was his first introduction to the Pharmaceutical Society, and it was a very pleasant one, and this was the next time he had had an opportunity of meeting them. Pharmacists helped medical men in various ways, and, to a certain extent, they taught them how to set about their work. He believed in food, and he also believed in physic. In the case of food it was not only the material which had to be considered, but how it was cooked, and in the same way the making had a good deal to do with physic; what would be nauseous, unpalatable, and indigestible and useless as a drug in one way, when properly prepared and disguised became the most valuable medicine which could be taken. Over and over again it had happened to him in his practice to be told, "It is no use prescribing so-and-so, the patient cannot take it," but when the same remedy was prescribed in some other way it was taken without difficulty, and did the good which was expected. Not only so, but

some of the best teaching books that he knew with regard to medicine, and the way of prescribing medicines, had been prepared by distinguished members of the Pharmaceutical Society. He might refer particularly to the most admirable hand-book to the Pharmacopœia by his late friend, Peter Squire, and also to a more recent book, published by a well-known member of the Society, Mr. Martindale, which was the most useful book with regard to medicine that medical men could possibly have on their tables. There was one medicine he often had to prescribe, however, which was not included in the Pharmacopœia, viz., *ferrum frigidum et acutum*, but even when that was required Dr. Johnson had pointed out how usefully chemical and pharmaceutical science came in to aid the surgeon accomplishing his work successfully in relieving the patient's sufferings.

Dr. MEYMOTT TIDY said he had been entrusted with the honour of proposing the toast of the evening, and the enthusiasm with which it would be received would in no way be dependent upon the want of originality of thought or lack of eloquence of the proposer. He did not know whether he would be excused if he ventured to use a Greek word; pharmacy and pharmacist had been, to use a Shakespearian phrase, ill-assorted. The word *pharmakis*, from which the words pharmacy and pharmacist were derived, signified not only a compounder of medicines, but a poisoner and a witch. Awkward as that was there was some ground for it, for in days gone by necromancers lived on pharmacy, and conversely pharmacy lived on necromancers, and this was the reason which gave a special charm to those old stories of the Borgias and others, and made them fitting subjects for the drama and romance. It required a tremendous power to sever the tie that bound together witchery and pharmacy; that was the work of the older pharmacists, and they set themselves to that work in right good earnest. It required a tremendous force to teach the public that the modern compounder of medicine needed no stuffed crocodile to preside over his laboratory, and no incantations to give virtue to his drugs. This divorce being effected, it was necessary to bring about a new marriage, and in effecting that the Society had played no unimportant part. It was necessary, as they had dissolved the union between witchery and pharmacy, to show that there was relationship between pharmacy and science, and it was here that the Society crept in, and the professors appointed by it set themselves to work to prove it. There never was a time in the history of the world when pharmacy was exhibited as a science in the manner in which it was at the present time. It only needed honesty of purpose and determination to oppose every form of quackery in all its protean shapes and forms, to cement the union which he honestly believed no time could sever, and no age could rust. If they were to continue this relation of science and pharmacy, they must take their care that the professors and future practitioners were men learned in their science, for if they did not establish that, one of two things would happen, either that pharmacy would soon become a kind of dead letter, or the public would lose their faith in it, or it would again form an unholy alliance with witchery and incantation. For that reason the examinations had been established which were the very foundation on which the prosperity of the Society depended. The work was not yet done, the Society had passed no finality measure; what had yet to be done was, for the most part, work of detail, but delicacy of treatment was inseparable from the carrying out of details. It was not for him to suggest those details, but many of them were known to and acknowledged by the public. In carrying them out they required a clear headed leader, judicious, firm, far-seeing, but not sensational, one who could grasp the requirements of the public as well as he could climb a mountain; a man of science who was not above being a man of the world, and such a man he ventured to think they might find in a pre-eminent degree in his friend, Michael Carteighe. He, therefore, begged to proposed the "Prosperity of the Pharmaceutical Society of Great Britain," coupled with the name of the President, Michael Carteighe.

The PRESIDENT, on behalf of the Society, begged to thank Dr. Tidy for having expressed in such superlative terms the merits not only of the Society which he had the honour to represent, but also his own capabilities. It was impossible for him to reply in adequate language to what had been said, especially as the hour was getting late, and therefore he would simply say that he was much obliged for the manner in which the toast had been proposed and responded to, and that all the strength he could bring to bear tending to the welfare of the Pharmaceutical Society, had been at their service. He now begged to propose the last toast of the evening, viz., "The Health of their Guests." They had amongst them men distinguished in Parliament, in science, and in various ways, some whom he knew, and some whom he had not the privilege of knowing, but to all he tendered a hearty welcome and ventured to express a hope that their time had not been spent altogether unpleasantly. He would associate with the toast the names of three gentlemen, a Member of Parliament, a representative of science, and a representative of medicine, namely, Mr. Daniel Grant, M.P., Sir Frederick Abel, and Dr. B. W. Richardson.

Mr. DANIEL GRANT, M.P., having briefly acknowledged the compliment,

Sir FREDERICK ABEL said it had been his privilege and pleasure to attend many of these social gatherings, but he had never spent a more delightful evening than on that occasion. He had been associated with Mr. Carteighe in many and arduous works, and the only fault he had to find with him was that he had not given him any warning that he would have to respond to this toast; that must be his excuse for not attempting to make a speech, but it was always pleasant for chemists to meet pharmacists, they were naturally united together and belonged to one body.

Dr. RICHARDSON said the only objection he had to responding to this toast was that he had been so long intimately connected with the Society that he could hardly fancy himself a guest. He never met with pharmacists but what he felt one of themselves and quite at home. He was, however, very glad of the opportunity to thank them, not only for their hospitality that evening, but for the progress they were making as a Society, and for the great services they rendered to medical science. The old days seemed to have passed away when the general practitioner of medicine sent out his boy heavily laden with his basket of drugs to dispense from door to door what were called remedies, and the chemist had taken in a different way a place which seemed far more rational and useful. He noticed too that as days went on they linked themselves together as two professions still more closely. There was the Pharmacopœia, which came out under the combined influence of pharmacists and physicians. There was another book which came out regularly, not officially, edited by a member of his profession and a member of theirs, which really in its character was quite equal to the official Pharmacopœia. Wherever they turned now they found that in all the advances in medicine the assistance of the pharmacist was required, and medical men, therefore, were deeply indebted to pharmacists for the help they gave them in advancing medical science, in the prevention of disease, and in the lessening of mortality.

The evening was much enlivened by some clever musical sketches by Mr. Corney Grain.

The Pharmaceutical Journal.

SATURDAY, MAY 24, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL MEETING.

THE full report of the proceedings at the various meetings of chemists and druggists in the metropolis during the past week, which appears in another part of this Journal and has involved the addition of eight extra pages, renders unnecessary, and indeed precludes any lengthened description of them in these columns. It may be remarked, however, that so far as abstention from criticism may be taken as an evidence of satisfaction, the proceedings at the Annual Meeting of the Pharmaceutical Society on Wednesday may well be accepted by the outgoing Council as an indication that the members of the Society have endorsed with their approval the account of the manner in which its business had been conducted during the past year, as laid before them in the Annual Report. The course taken also supplies another refutation of the statements which have been made on more than one occasion to the effect that the Council as an executive body is not fairly representative. The meeting was moderately well attended, and the President, following the plan adopted by him last year, instead of delivering a formal address, made a running commentary upon the topics mentioned in the Report, and concluded by moving its adoption. In this way the questions which have usually given rise to more or less discussion—not unfrequently of a very desultory and unprofitable character—appeared to be all anticipated, for the motion having been seconded by the Vice-President, no person present responded to the invitation of the Chairman to raise any discussion. It was therefore put at once and was carried by acclamation within half an hour of the commencement of the meeting. The results, too, shown in the Scrutineers' report, presented at the adjourned meeting on Friday, may be regarded as a vote of confidence, since the whole of the retiring members of the Council were re-elected by a substantial majority, the number of votes given to the successful candidate lowest on the poll exceeding the number given to the unsuccessful one next below him by as many as it fell below the highest figure polled. It appears to us, however, to be matter for regret that the absence of any burning question seems to have favoured the neglect to use the voting power to even a greater degree than usual, only about one-third of the voting papers sent out having been returned. Nevertheless this also may be taken as evidence of satisfaction so far as the members of the Society are concerned. Indeed this view of the case may be pushed further, for it may be assumed that persons who voluntarily remain outside the body which so largely controls the conditions under which their calling can be followed, are not entirely without confidence in its governing capacity.

The ordinary business of the Annual Meeting having thus been disposed of, the ground was cleared for Mr. GILES to bring forward the motion of which he had given notice, a duty that he performed with his habitual eloquence. The proposition that the Council should be requested to consider and report on the best means of promoting systematic research with a view especially to the initiation, examination and improvement of formulæ for the National Pharmacopœia, contained one suggestion as to the way in which this end might best be attained, and in the course of his remarks the speaker evidently showed that he would be inclined to look for the best solution of the problem in the establishment of a special laboratory, with a staff of investigators whose time should be entirely devoted to working out the many points in connection with drugs and pharmacy which are now obscure and doubtful. Assuming that pharmaceutical research is the natural foundation of a scientific pharmacopœia, and that such research is the province of pharmacy, Mr. GILES argued that the Pharmaceutical Society is responsible for fulfilling this duty, since the obligation did not rest on individuals. He said he was inclined to think that while pressing the claim of pharmacists to be associated in the compilation of the Pharmacopœia, the Society had been a little disposed to overlook its own obligations, but that when these had been fulfilled in the manner he advocated, the claims of British pharmacists to be represented on the Pharmacopœia Committee would be irresistible. Admitting and emphasizing the work done by the Society in the past, in the way of organization and education, he urged that the time had come for it to take a new departure in the direction of pharmaceutical research. In the course of the discussion that followed most of the speakers expressed sympathy with the spirit of Mr. GILES's motion, though it cannot be said to have received unqualified support from any one of them. Mr. MARTINDALE seemed inclined to favour the establishment of fellowships, whilst Mr. LUFF leaned to the offering of prizes for the best papers on given subjects. Mr. SCHACHT disputed the view that a responsibility which did not lie upon individual pharmacists could be obligatory upon the multitude of individuals that formed the Society, or that the Pharmaceutical Society would under present conditions be competent to decide what were the subjects to be investigated. Mr. NAYLOR thought it was equal to a confession of weakness, a losing sight of what had been already

done by individual pharmacists in original research, to say that the attainment of a *locus standi* in the Pharmacopœia Committee is dependent upon the engagement of a certain number of men to do this work for pay. But the most powerful argument against the motion was that it was inopportune. This view, which was first broached by Mr. HAMPSON and then reiterated by Mr. EKIN, was subsequently put in so cogent a form by the PRESIDENT, that Mr. GILES at once responded to his request, and, with the leave of the members present, withdrew the motion, and this practically brought the meeting to an end.

With respect to what may be termed the annual festivities, it can be said that they passed off in a most satisfactory manner. More than two hundred gentlemen sat down at the Annual Dinner on Tuesday evening, and among the guests were many eminent in medical and scientific circles, the esteem in which the Society is held having been manifested by their presence as well as by the oral testimony of those who became the spokesmen in connection with the toasts. Taken altogether, we remember no previous similar occasion on which the evening went more pleasantly or the object of the gathering was more thoroughly attained. On the following evening the President, Vice-President and Council received nearly three thousand visitors at the Conversazione, which by permission was held in the South Kensington Museum.

The Medical Bill was introduced into the House of Commons on Friday the 16th inst., and read a first time. The second reading was set down for last Thursday, but it was then postponed until next Thursday week, the 5th of June.

* * *

At a meeting of the Sheffield Pharmaceutical Association, last week, Mr. Wilkinson-Newsholme called attention to an extraordinary sample of ginger, which contained a large admixture of nux vomica seeds. The seeds, like the ginger, had been washed with lime, and, although easily recognizable by a practised eye, had thus passed through two or three different hands without notice. We understand that Mr. Newsholme is endeavouring to trace the history of this parcel, and that he proposes to bring any information he may be able to obtain before the Pharmaceutical Society at an evening meeting. We would suggest also that the names of the firms by whom this article was supplied should be made known, not necessarily for publication, but for the information of the Standing Committee on Adulteration.

* * *

According to *Le Temps* considerable interest has been excited in Paris by a report that the child of a legal functionary had been poisoned by the administration of a suppository in which morphine hydrochlorate had been substituted for quinine hydrochlorate through a mistake in dispensing in a well-known Paris pharmacy. The affair is under investigation, but meanwhile a statement has been made to a correspondent of *Le Temps* by the owner of the pharmacy, which seems to demand, at least, a suspension of judgment until the inquiry is completed. The pharmacist states that on the 23rd of March, at 5 o'clock in the afternoon, a prescription was presented at his establishment ordering some suppositories, each containing ten centigrams of quinine hydrochlorate. The prescription, having been copied correctly, was handed to an assistant to dispense, and to prevent mistake, in consequence of the relatively unusual ingredient, a special instruction was given as to where the quinine hydrochlorate would be found. The preparation was, according to the custom of the house, checked by the manager and verified before being sent out. When the suppositories were delivered the child was somewhat better, and they were, therefore, not then used; but about six weeks later, the symptoms they were intended to relieve having returned, a suppository, said to have been obtained from this pharmacy, was administered. Shortly afterwards grave symptoms were manifested which were thought to be possibly referable to the suppository, and one was sent for examination to a neighbouring pharmacist, who, after a summary examination, came to the conclusion that it contained morphine. The child was, therefore, treated for morphine poisoning, and, after some hours, the danger appeared to have passed away; but about twenty hours afterwards the child again became worse and died.

* * *

The *Weekly Drug News* of New York, in referring to the process recently described by Professor Redwood for the exhaustion of cinchona bark, speaks of it with approval as a step towards the standardizing of pharmaceutical preparations and as yielding "an elegant extract which has the great advantage of bearing dilution with water without precipitation." But it points out that this desirable quality of water solubility is secured by the elimination of the "peculiar extractive, chiefly quinovin," and demurs to the assumption, in the present state of our therapeutic knowledge, that this "quinovin" has no medicinal value. Against the reference made by Professor Redwood to Mr. Howard's opinion, it quotes a passage from Professor Flückiger's recent work, 'The Cinchona Barks Pharmacognostically Considered,' to the effect that "chinovin participates in the medicinal activity of cinchona barks." Moreover, the *Weekly Drug News* thinks that "if elegance and water solubility are the objects to be attained, the alkaloids may be employed in preference to the bark."

* * *

The *Pharmaceutical Record* calls attention to some curiosities in prescribing and dispensing as having been disclosed in a "blue book" issued by the Canadian Government, apparently giving the results of an inquiry into the working of an Act under which the registration of sales of liquors containing alcohol by druggists was made obligatory, with a view of allowing such sales when the liquor was ordered by a medical practitioner for medical purposes only. A single quotation will be sufficient to show the extent to which the permission was abused. In one drug store, from May 1 to January 1, there were 3720 prescriptions dispensed that are noted in this blue book. One particular patient, judging from the prescriptions bearing his name, was sick all this time; in fact, his state seems to have been so serious that occasionally a second physician was called in and prescribed for him. The prescription on the 1st of May was for "Spiritus

Frumenti, one bottle." This was repeated on the 3rd, on the 5th and on the 9th, on which day there were two prescriptions, each to the same effect. Between the 1st of May and the 1st of January this patient seems to have had sixty-two of these prescriptions dispensed at the same drug store, including repetitions. During the whole of this time the treatment remained unchanged, and at its close the patient still "lingered." The bearing of this experience upon the position taken by the Inland Revenue authorities in this country in respect to this question will be obvious.

* * *

Already a second edition of the new French Codex has been issued, in which several errors that had been pointed out in the first edition have been corrected. Two or three tables have been omitted and the one showing the relations of foreign medicinal weights to the gram, the incorrectness of which we were the first to point out, has been entirely reconstructed on more exact data. A remark that we made with respect to the use of the colour bands to indicate the divisions of the work seems to have been much misconstrued. One French writer saw in the remark evidence of a desire to say "*quelques malices*" and now another tells us that "the edges no longer bear those clamorous colours which caused our neighbours to smile." M. Ferrand, in the *Union Pharmaceutique*, raises the question as to the position of those pharmacists who in obedience to the decree of the 13th of February promptly obtained a copy of the new Codex, some of the formulæ in which have already been seriously modified. In order to avoid a "therapeutic disorder, as dangerous as it is ridiculous," he recommends that the Minister should give instructions to the publisher to withdraw the first edition and give in exchange copies of the second.

* * *

The French Association for the Advancement of Science will hold its third Annual Meeting on the 4th to the 11th of September, inclusive, in the city of Blois, under the presidency of M. Bouquet de la Grye.

* * *

In connection with the next Annual Meeting of the German Pharmaceutical Association, which will be held in Dresden on the 2nd, 3rd, 4th and 5th of September, there is to be a Pharmaceutical Exhibition, for the display of pharmaceutical and chemical preparations, dietetic articles, utensils, apparatus, machines and printed matter. The President of the Exhibition Committee is Dr. E. Geissler, Schreibergasse, Dresden.

* * *

On Monday next, at 9 a.m., Mr. Wyndham Dunstan will commence the course of lectures on Organic Chemistry, in connection with the School of Pharmacy of the Pharmaceutical Society. A detailed Syllabus of these Lectures, supplemented by a Synoptical Table of the Principal Hydrocarbons and their Principal Derivatives, has been prepared and published as a pamphlet.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, May 29, at 8 p.m., when some "Notes on Asafœtida" will be read by Mr. R. W. C. Pierce, and a Report on Inorganic Chemistry will be made by Mr. A. J. G. Lowe.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 21, 1884.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Robbins Savage, Schacht, Symes, Williams, and Woolley.

Restorations.

Several Members, Associates, and Apprentices were restored to membership on payment of the usual fine.

The Council considered the business of the Annual Meeting and then adjourned.

FORTY-THIRD ANNUAL GENERAL MEETING.

The President took the chair at twelve o'clock.

The Secretary having read the notice convening the meeting, the Report was taken as read.

The Annual Report.

The Financial Statement for 1883 shows that the income of the Society for that year exceeded the expenditure by £1526 16*s.* 7*d.* The gross receipts from the subscriptions of Members, Associates, and Apprentices are rather in excess of the previous year, although the amount received from Members only is somewhat less. The examination fees produced upwards of £700 more than in 1882, but in consequence of the larger number of candidates there has been a proportionate increase in expenditure. The Journal account leaves a small balance in favour of the Society, which, however, is about £400 less than last year.

In pursuance of a resolution referred to at the last Annual Meeting, the Council has been engaged in seeking eligible investments in freehold ground rents for a portion of the Society's invested capital. Freehold ground rents at Paddington Green amounting to £5551 5*s.* 6*d.* have been purchased, on account of the General Fund, and also at Strawberry Hill, amounting to £1020 12*s.* 6*d.*, on account of the Benevolent Fund.

The number of candidates for examination during 1883 was 396 more than in the previous year. Of this increased number 270 were candidates for the Preliminary, 116 for the Minor, 8 for the Major, and 2 for the Modified. The new regulation by which more time for answering the questions is allowed to candidates in the Preliminary examination appears to work satisfactorily.

The attendance in the Library during the past year has been considerably higher than for several previous years. The number of books circulated has been practically the same during the past three years, in 1881, 3284; in 1882, 3250; in 1883, 3240. Although it does not appear that the Parcels Post has had much influence in increasing the circulation of books, the cost of carriage has been gradually diminished. Most important English and foreign works upon the sciences and arts in which pharmacists are interested are added to the Library soon after publication. The number of volumes added during 1883 was about 250.

Receipts. GENERAL FUND—FINANCIAL

	£ s. d.	£ s. d.
Balance January 1st, 1883:—London and Westminster Bank Deposit	2000 0 0	
In Treasurer's hands	1862 11 8	
In Secretary's hands	75 12 8	
In Honorary Treasurer's hands (Scotland)	84 17 4	
		4023 1 8
Life Members' Fund:—Interest		87 16 11
Interest on Investments		689 10 0
Subscriptions:—1632 Members, Pharmaceutical Chemists	1713 12 0	
760 ,, Chemists and Druggists	798 0 0	
1178 Associates in Business	1236 18 0	
827 Associates not in Business	434 3 6	
1098 Apprentices or Students	576 9 0	
14 Entrance Fees	29 8 0	
	4788 10 6	
Fees paid upon restoration to the Society	48 6 0	
		4836 16 6
Examination Fees:—1609 Preliminary Examination	2887 0 0	
10 Modified ,,	10 10 0	
798 Minor ,,	2140 10 0	
112 Major ,,	459 19 0	
		5497 19 0
Journal:—Advertisements	4563 0 3	
Sales	479 5 1	
		5042 5 4
Registration Fees:—18 Fees for Restoration to the Register	18 18 0	
14 Registration Fees as Chemists and Druggists	73 10 0	
		92 8 0
Register:—Sales to the Government	146 15 0	
Sundry Sales	13 10 0	
		160 5 0
Calendar:—Sundry Sales		15 12 0
Penalties and Costs for infringements of the Pharmacy Acts		147 2 1
Investments:—Sale of £5575 New Three Per Cents		5546 10 10
Sale of old Apparatus		1 6 6
		£26,140 13 10

STATEMENT FOR 1883.

Expenditure.

	£ s. d	£ s. d
Annuity—Dr. Redwood		100 0 0
Carriage of Books to or from the Library, and other parcels		24 11 6
Certificates of Death		17 18 2
Conversazione	227 15 0	
Pharmaceutical Meetings	55 7 7	
		283 2 7
Examiners, Boards of—	*England and Wales.* / *Scotland.*	
Fees to Examiners	1310 8 0 / 337 1 0	
Fees to Superintendents—Preliminary Examination	156 9 0 / 22 1 0	
Hire of rooms for conducting Preliminary Examination	50 10 9 / 4 5 0	
Travelling Expenses	264 2 11 / 27 7 6	
Refreshments for Examiners	85 18 6 / 10 17 11	
Apparatus, Drugs, and Chemicals for Examinations and sundry charges in connection therewith	85 0 0 / 17 0 8	
	1952 9 2 / 418 13 1	
(*England and Wales*)	1952 9 2	
	2371 2 3	
Fees to the College of Preceptors	161 3 6	
		2532 5 9
Fixtures and Fittings (including Plate-glass Cases for Museum specimens)		314 10 0
Furniture		77 6 4
House Expenses:—Gas, Water, Coal, Cleaning Materials, &c.		245 10
Journal:—Editor and Sub-Editor's Salaries	575 0 0	
Paper	1210 19 10	
Printing	2199 4 7	
Publishers' Commission	574 1 7	
Contributions and Engraving	314 5 11	
Reporting	73 14 6	
Attending Conference Meeting at Southport	10 18 6	
Attending International Pharmaceutical Exhibition at Vienna	53 3 6	
Parliamentary Reports and Sundry Charges	26 3 4	
		5037 11 9
Laboratory:—Professor of Practical Chemistry—Endowment of Chair	100 0 0	
Prize Medals, Certificates, &c.	9 4 6	
		109 4 6
Law Costs		297 3 5
Lectures:—Professor of Chemistry and Pharmacy—Endowment of Chair	100 0 0	
Professor of Botany and Materia Medica—Endowment of Chair	100 0 0	
Subscription to Royal Botanic Gardens	21 0 0	
Prize Medals, Certificates, &c.	16 10 3	
		237 10 3
Library:—Librarian's Salary	220 0 0	
Purchase of Books, &c.	103 18 9	
Attending Library Association Meeting	10 10 0	
		334 8 9
Museum:—Curator's Salary	250 0 0	
Assistant's Salary	75 15 0	
Specimens, Bottles and Sundries	40 3 0	
		365 18 0
Branch of the Society in Scotland:—Secretary—Salary	150 0 0	
Rent, Taxes and Insurance	96 9 5	
Miscellaneous Expenses	65 0 1	
		311 9 6
Postage:—General	247 5 8	
Journal (Cost of transmission to Members, Associates and Apprentices)	654 0 11	
		901 6 7
Register, Printing and Publication of		166 19 9
Repairs and Alterations		591 2 8
Rent, Taxes, and Insurance of Plate Glass		379 8 4
Returned Subscriptions to Associates		14 3 6
Stationery, Engraving, Printing, and Office Expenses	303 15 2	
Publication of the Society's Calendar	128 12 9	
		432 7 11
Salaries:—Secretary and Registrar	550 0 0	
Assistant Secretary	300 0 0	
Clerks and Servants	814 6 4	
		1664 6 4
Part cost of paving the roadway in Great Russell Street with wood		170 0 0
Cost of Materials supplied to the Jacob Bell Scholars		10 0 0
Herbarium and Council Medals		5 5 0
Sundries		7 17 10
Travelling Expenses—Members of Council		366 16 0
Refreshments for Council		46 0 2
Investments:—Purchase of £2000 New Two and a Half Per Cents		1750 0 0
Purchase of Freehold Ground Rents at Paddington Green, London, W.		5551 5 6
Balance, December 31st, 1883:—London and Westminster Bank on Deposit	2000 0 0	
In Treasurer's hands	1490 0 10	
In Secretary's hands	156 11 1	
In Honorary Treasurer's hands (Scotland)	148 11 8	
		3795 3 7
		£26,140 13 10

BENEVOLENT FUND—FINANCIAL STATEMENT FOR 1883.

Receipts.

	£	s.	d.	£	s.	d.
Balance Jan. 1st, 1883						
In Treasurer's hands	599	13	7			
London and Westminster Bank on Deposit	500	0	0			
In Secretary's hands	1	0	9			
				1100	14	4
Dividends on Invested Capital				585	5	2
Donations	386	5	0			
Subscriptions	1535	16	8			
				1922	1	8
Investments :—Sale of £1000 Consols				1008	3	6
Balance due to Secretary, Dec. 31st, 1883				0	15	9
				£4617	0	5

Expenditure.

			£	s.	d.	£	s.	d.
20	Annuitants, each received £35		700	0	0			
9	Ditto ditto £30		270	0	0			
2	Ditto, received	1 quarter at £30	15	0	0			
		3 quarters at £35	52	10	0			
3	Ditto	2 quarters at £30	45	0	0			
		2 quarters at £35	52	10	0			
1	Ditto	3 quarters at £30	22	10	0			
		1 quarter at £35	8	15	0			
2	Ditto (deceased)	1 quarter at £35	17	10	0			
1	Ditto (do.)	do. £30	7	10	0			
1	Ditto (do.)	2 quarters at £35	17	10	0			
2	Ditto (do.)	3 quarters at £35	52	10	0			
1	Ditto (do.)	do. £30	22	10	0			
						1283	15	0

Casual Grants.

A Member, Grimsby	age 64	10	0	0	
A former Member, Brighton	,, 66	10	0	0	
Ditto London	,, 82	25	0	0	
Ditto Bridport	,, 62	20	0	0	
Ditto Hereford	,, 76	10	0	0	
Ditto Kingston-on-Thames	,, 55	10	0	0	
Ditto London	,, 63	20	0	0	
Ditto London	,, 65	10	0	0	
Ditto Dulwich	,, 61	10	0	0	
Ditto London	,, 70	10	0	0	
Ditto Sidmouth	,, 80	10	0	0	
Ditto Leamington	,, 69	10	0	0	
Widow of a Member, London	,, 40	10	0	0	
Ditto Ledbury	,, 42	10	0	0	
Ditto Dulwich	,, 55	10	0	0	
Ditto Holywell	,, 54	10	0	0	
Widow of a Life Member, London	,, 42	15	0	0	
Widow of a Member, Torquay	,, 62	10	0	0	
Ditto Eastbourne	,, 72	10	0	0	
Ditto Penrith	,, 74	10	0	0	
Ditto London	,, 44	5	0	0	
Ditto Whittlesea	,, 47	5	0	0	
Ditto Romsey	,, 47	20	0	0	
Ditto London	,, 56	10	0	0	
Orphans of a late Member, London	,,13&8	50	10	0	
A former Associate in Business, Penge	,, 39	10	0	0	
Widow of an Associate in Business, Carmarthen	,, 31	5	0	0	
Orphans of an Associate in Business, Ulverston	,, 8&7	10	0	0	
A former Associate, Herne Hill	,, 58	5	0	0	
Widow of an Associate, Brockley	,, 53	10	0	0	
A Registered Chemist and Druggist, Newcastle-on-Tyne	,, 60	5	0	0	
Ditto Hertford	,, 59	5	0	0	
Ditto Edinburgh	,, 57	5	0	0	
Ditto Edinburgh	,, 41	10	0	0	
Ditto Warrington	,, 71	5	0	0	
Ditto Croydon	,, 51	5	0	0	
Ditto St. Leonards	,, 76	10	0	0	
Ditto Liverpool	,, 47	10	0	0	
Ditto Edinburgh	,, 69	10	0	0	
Ditto Gloucester	,, 56	5	0	0	
Ditto Liverpool	,, 69	10	0	0	
Ditto Birmingham	,, 41	10	0	0	
Widow of Regd. C. & D., London	,, 47	15	0	0	
Ditto Salford	,, 41	10	0	0	
Ditto Acton	,, 58	5	0	0	
Ditto Falkingham	,, 75	10	0	0	
Ditto Ilford	,, 36	10	0	0	
Ditto London	,, 47	20	0	0	
Ditto Bury St. Edmunds	,, 32	10	0	0	
Ditto London	,, 59	10	0	0	
Ditto London	,, 62	15	0	0	
Ditto Brigg	,, 46	10	0	0	
Ditto Norwich	,, 53	10	0	0	
Ditto Kidsgrove	,, 71	10	0	0	
Ditto Liverpool	,, 66	10	0	0	
Ditto Wells	,, 47	5	0	0	
Ditto Barnes	,, 48	10	0	0	
Ditto Surbiton	,, 61	10	0	0	
Ditto St. Neots	,, 50	10	0	0	
Ditto Clay Cross	,, 37	5	0	0	
Ditto Sheffield	,, 51	5	0	0	
Orphans of Regd. C. & D. Cardiff	,,18,17 15, 13, 11, 9, 6.	10	0	0	
				660	10	0
The Secretary's Casual Fund				15	0	0
Second payment from the Robbins Fund				5	0	0
Printing and Stationery, etc.		29	5	6		
Postage		17	8	0		
				46	13	6
Investments :—Purchase of £800 Consols				819	0	0
Purchase of Freehold Ground Rents at Strawberry Hill				1020	12	6
Balance in Treasurer's hands, Dec. 31st, 1883				766	9	5
				£4617	0	5

We, the undersigned Auditors, have examined the accounts of the Pharmaceutical Society of Great Britain, as presented in the Financial Statement and Benevolent Fund Account, and find them correct. We have inspected the Deeds relating to the Freehold Ground Rents named below, and also find that there was standing to the account of the Society at the Bank of England, and in the hands of the Society's Bankers, on the 31st December, 1883, the undermentioned Stocks, viz.:—

		£	s.	d.	£	s.	d.
General Fund	New 3 per Cents.	14,925	0	0			
	New 2½ ,,	2,000	0	0			
	Freehold Ground Rents				16,925	0	0
	at Paddington Green, London, W., cost.				5,551	5	6
Life Members' Fund	New 3 per Cents				3,000	0	0
Benevolent Fund	Consols				18,400	0	0
	Freehold Ground Rents at Strawberry Hill, cost.				1,020	12	6
do. (Robbins' Fund)	South Metropolitan Gas Stock, since converted by an Order of Council into £125 Gas Light and Coke Co. 4 °/₀ perpetual Debenture Stock.				£0	0	0
Secretary's Casual Relief Fund.	Consols.				105	0	0
Pereira Memorial Fund	Consols.	100	0	0			
Bell Memorial Fund		2,050	0	0			
Hanbury Memorial Fund		400	0	0			
					2,550	0	0
Hills Prize Fund	Russian Bonds				300	0	0

W. HODGKINSON,
F. HARWOOD LESCHER,
S. LLOYD STACEY,
HENRY AYSCOUGH THOMPSON, } *Auditors.*

February 28th, 1884.

In the Museum considerable alterations have been made. The large and rapidly increasing collection of Materia Medica has been separated into two sections, the one specially adapted for study and examination by *students*, and the other comprising such specimens of the materia medica as are most conveniently grouped for purposes of *reference*. The latter have been placed in a series of handsome new cases erected for their reception around the walls of the large examination room. Further facilities for study are now offered by the addition of three tables in No. 1 Museum, by which a larger number of students than heretofore will be enabled to examine the specimens at the same time. A glass case has been placed in No. 4 Museum, devoted especially to the exhibition of new donations to the Museum, and of drugs and chemicals of recent introduction, and it is hoped that the concentration of such articles in one place will be of service to visitors.

The materia medica collection has been enriched by the addition of a valuable series of Cinchona barks from the Government plantations in Darjeeling, and donations have been received from the Planters' Association in Ceylon and others. The value of these barks for reference is much increased by the fact that they were accompanied by herbarium specimens taken from the same trees, and that many of them have been analysed by Dr. B. H. Paul, by whom also the Madras barks mentioned in last year's report have been analysed. The results of the analyses are attached to the specimens. To the collection of Japanese drugs has been added a large number of specimens received from the Royal Gardens at Kew. An extensive collection (numbering two hundred and fifty-seven specimens) of the materia medica of Brazil and the neighbouring countries, has recently been presented by Dr. Domingo Parodi, of Buenos Ayres, and a series of native remedies, from the Hudson Bay territory, by Mr. Walton Haydon.

The Evening Meetings during the Session have been well attended, and many important papers read. With a view to increase the interest in the meetings, the Curator has been in attendance for an hour before the Chair was taken to give information respecting such specimens and apparatus as may be placed on the table for exhibition.

During 1883 one hundred and twenty cases of infringement of the Pharmacy Act, 1868, were re-

ported, in most of which the offences were discontinued upon receipt of notice from the Registrar. In some instances it was found necessary to institute proceedings, and penalties were recovered.

In the last report it was stated that a draft Bill for the amendment of the law relating to the sale of poisons, prepared at the request of the Lord President of the Council, had been submitted to the Government. In this draft your Council had inserted such amendments of the Pharmacy Acts as were considered necessary. The Bill was not introduced last session, and in reply to an inquiry recently made, the Government have intimated that in the Bill which they propose to introduce into Parliament during the present session it is intended to deal with the sale of poisons only. Under these circumstances the Council considers that the wisest course is to suspend all further action in the matter until the publication of the Government Bill.

The Medical Acts Amendment Bill, which was withdrawn last session, has been again introduced into Parliament, but the Council regrets to have to report that the important and reasonable request addressed to the promoters of the Bill, that provision should be made for the representation of pharmacists on the Pharmacopœia Committee, has not been conceded. A Committee of the Council has charge of this matter, and it is intended to make vigorous efforts to obtain the desired representation.

The Patents, Designs and Trade Marks Act, passed at the end of the last session of Parliament, contained, when first introduced, a clause relating to the use of the Royal Arms which might have been a source of much vexation to pharmacists and others if it had become law. A correspondence on the subject between the Council and the Board of Trade resulted in a satisfactory modification of the clause which was subsequently adopted by Parliament.

The recommendations of the Education and Examinations Committee which were included in the last Annual Report have continued to receive the attention of the Council, and with a view to carrying out these recommendations as far as practicable, alterations in the Bye-Laws are being prepared, and will be submitted to the Society in due course.

The Benevolent Fund has received the careful attention of the Council. Owing to the zeal and perseverance of many of the Local Secretaries and others the income of the previous year has been well maintained. There are, however, so many members of the trade who do not subscribe that it is hoped that every Local Secretary who has not yet made a *personal* appeal on behalf of the Fund will do so. The publication in a special issue of the Journal of a local list of subscriptions and donations reported last year was repeated in February of the present year.

Commodious and suitable premises for carrying on and developing the work of the Society in Scotland have been secured by the purchase of the house, No. 36, York Place, Edinburgh.

The presentation of the Hanbury Memorial Gold Medal took place in October last, the recipient being the eminent quinologist, Mr. John Eliot Howard, a Member of this Society. The Council regrets to have to record the death of Mr. Howard within a few weeks of his having received this well-earned honour.

The Society has also lost by death amongst others, Mr. William Squire, formerly an Auditor; Mr. John Henry Atherton, formerly a member of the Council; Mr. Benjamin Hunpage, also formerly an Auditor. The names of Mr. Hatrick, of Paisley, Mr. John Bray, of Sheerness, Mr. Ralph Davison, of York, and Mr. Duncanson, of Stirling, who have served the Society as Local Secretaries, have also to be added to the list of our losses for the year.

The Council has the painful duty to record the death of that veteran pharmacist, Mr. Peter Squire, one of the founders and a member of the *first* Council of the Society, whose services to it were continued with unabated zeal from its foundation until the year 1870. He filled the office of President for three years, was a member of the *first* Board of Examiners, and remained one of the most active members of that Board for the long period of twenty-seven years.

The Council cannot close this Report without reference to the loss sustained by the scientific world in the deaths of M. Dumas, the eminent French Chemist, and Professor Balfour, both Honorary Members of this Society. To the latter the Board of Examiners in Scotland was indebted for botanical specimens for examination purposes whilst he was Regius Professor of Botany in the University of Edinburgh.

The PRESIDENT said his first business was to move the adoption of the Report, in doing which it would not be necessary to detain the meeting very long. The reports of all public bodies were more or less dry when there were no dividends to declare, but at the same time this Report was interesting as a record of what had been done, and also to a certain extent of what had not been done. But this Report did not by any means represent, nor could any report represent, the amount of work which the Executive of a body like that had to get through in the course of twelve months. They were naturally anxious not to say too much, and where they could not accomplish something definite they passed over the matter without reference. The first paragraph referred to the financial statement, which might on the whole be regarded as satisfactory. There was a special paragraph with regard to the Journal, a matter in which many business men in the Society took great interest, because that was the one branch of their work in which they might be said to be carrying on a business. They were proprietors and publishers of the Journal, and members sometimes criticized their business capacity in that respect. With regard to that point, the balance was less this year than last, which might be accounted for in several ways, but broadly it was due to a somewhat diminished receipt on the score of advertisements. The Council had recommended that there should be a special issue of the *Pharmaceutical Journal* made once a year, which should be sent to every registered chemist and druggist, with a view to assisting the Benevolent Fund, and also showing those members of the drug trade who did not belong to the Society the sort of work it was doing, its interests and its objects. Although this special number was largely supported by advertisements, it appeared that the general income in that respect for the year was rather below the average, and consequently the increased cost of that special issue and the increased expense of distribution had made the balance reach the sum of about £400. But this was not to be looked upon entirely as wasted or lost. In all cases of advertising, they must throw their bread on the waters and trust to its being returned in increased quantity in due time. If in the course of time it was found that this special issue did not produce good results it would be quite possible to discontinue it, but it was too soon yet to say that such was the case. The next paragraph referred to the investments, on which

he might say that the resolution adopted last year to transfer a certain portion of the invested capital from the funds into freehold ground rents had been carried out, and the experience thus gained distinctly confirmed the views he expressed last year of the great advantage likely to result to the Society by so doing. Last year he referred to the possibility that the Three per Cents would or might be converted, and there was actually a proposition now before Parliament which was tantamount to a conversion, the consequence of which was that the value of ground rents and all securities of that kind had gone up very materially. Nevertheless he felt certain that it would be possible to invest a portion of the capital of the Society on perfectly good security, and with very advantageous results, even at the slightly increased price which all such securities would now command. The examinations showed a considerable increase financially, but it would also be noticed that there had been a considerable number of failures. Of course from a financial point of view every person who came up for an examination was considered a fresh candidate, but as a matter of fact the real number of new candidates was considerably less than the figures indicated, because some came up two, three, four, and even six times. The Library had been very much appreciated by both the town and country members during the year, and it was the duty and pleasure of the Council to make it as useful and profitable as possible to the members. The Museum was also a source of care and interest to a large portion of the Council, and under the watchful care and active search which the Curator made for new things it had become a Museum of which they might all be proud. The Evening Meetings had been, as usual, generally interesting, and had illustrated, to some extent, the desire there was in certain quarters for pharmaceutical research. There had been about the usual number of applications with regard to infringements of the Act, and the Council had done its best to make the law obeyed. Some members at times thought it would be well, in certain cases, not to give notice to offenders before commencing proceedings, but it appeared to him that that was a mistaken view, as might be shown by an incident which had lately occurred. The Council had recently had before it a letter from the Treasury giving the particulars of a case in which an appeal had been made to remit a fine imposed upon a man who had been trading illegally, and in corresponding with that Department it had been able to show that all fair means had been taken to carry out the Act, and that no man was taken unawares and brought before a judge. With reference to the Draft Bill, they all knew that the Privy Council had decided that they would themselves deal with the question of the sale of poisons, but would not at the present time entertain any proposition which involved an amendment of the pharmacy clauses of the Act. What the exact result would be they could hardly say until the Bill was printed, but when they had it before them they would have to consider very carefully how best to protect the interests of the whole body. But although the Government said they proposed to restrict their legislation to the sale of poisons, he had not much doubt that the subject of patent medicines would be dealt with, and that the Bill would contain provisions which would commend themselves to many of their members. If it were possible for the Society to support the Government on the broad question of the sale of poisons, it would be a great advantage, because there would be then a reasonable probability that they might be able by their own efforts in Parliament, through private members, to get the pharmacy clause amended, and the various details inserted which were required for the perfection of the pharmaceutical machinery, whereas, if they had to oppose the Government tooth and nail on this point, there would be much more difficulty in dealing with pharmaceutical questions hereafter. Be that as it might, however, the Council would give every attention to the Bill when it appeared, and possibly, if the Government did not see their way to making some efforts in legislation this year, the Council might consider the desirability of moving independently in the matter. The Medical Acts Amendment Bill was read a first time last week, and was down for second reading in the House of Commons on the following day, but it was not at all probable that it would be reached for several weeks, and it would be the duty of the Council to impress first upon Mr. Mundella and afterwards on the House itself, if necessary, the importance of formally recognizing the claims of pharmacists to be on the Pharmacopœia Committee. There was no doubt this was the feeling of the Society at large, and although to some people it appeared to be merely sentiment, it was one of those sentiments which every right-minded pharmacist ought to respect, and he was quite satisfied that the majority of the medical profession were not indisposed to consider favourably the claims of pharmacists in this direction. The Trade Marks Act passed last session contained when first introduced a rather vague clause with regard to the use of the Royal Arms, and it was the duty of the Council to take steps to have it modified, and he thought it might claim a success in that direction, because the law officers of the Crown had stated since the Bill was passed, in answer to questions, that the clause as amended would not prevent the use of the arms on labels, and in the various ways in which pharmacists and others used them. One of the things which impressed the President of the Board of Trade more than anything else was a fact he was able to state at that time that something like two million bags to hold nuts were being made in Bristol with the Royal Arms upon them, and when the difficulties of dealing with cases of that sort were pointed out he at once saw the expediency of modifying the clause. The educational business of the Society was of the first importance, and, consequently, it was with some regret that the Council was not prepared at the present moment to bring forward the complete scheme which it had been working on for several years, but in view of the uncertainties which prevailed with regard to pharmaceutical legislation it was thought expedient for the moment to give this further consideration, and to present the scheme later on. The Benevolent Fund was making satisfactory progress. They had a fair number of donations, though not quite such a windfall as during the previous year. It might be as well to mention that they had received from Mr. Baigent the sum of 100 guineas, being the fourth donation from that gentleman, and a letter had also been received from Mrs. Squire, the widow of their late colleague, stating that £100 would be forwarded by his executors for the benefit of the Fund. He would also refer to the Secretary's Casual Fund to which sundry charitable members of the trade now and then contributed, and which was found of great value, as it enabled him without delay to relieve certain distressing cases which were hardly suitable to be brought before the Committee. The value of that Fund was much greater than many members imagined, and one case which had lately occurred might be referred to in illustration. A man who had been actually in the drug trade, but who lost his situation, walked to London, could not get employment, and would very soon have become an applicant for relief from the Fund; on inquiries being made he said he could find work in his native town, but that he had not the means of getting there. He was provided with shelter and food for a few days, and then sent home with a few shillings in his pocket, and he was now earning a very good living. With reference to the North British Branch, a house had been purchased for its use in Edinburgh. Those who had not visited the existing rooms in Edinburgh probably did not know how relatively small and inconvenient they were for the purposes of examination. As the important duty of examining in Edinburgh as well as in London was imposed upon

the Council, it was certainly right that proper premises should be provided in which those examinations might be conducted, and it was also thought desirable to stimulate their friends in the North to join the Society in large numbers, and work in sympathy with them. In fact that seemed to the Council an excellent way of advancing pharmacy. The house was extremely cheap, and, practically, it would cost such a capital sum as would only represent £70 or £80 a year, which was about the same as they were now paying for one floor. During the past year they had lost, by death, Mr. Howard, very soon after he received the Hanbury Gold Medal, and rather a large number of past officers of the Society. Amongst them it was only fitting to specially refer to the late Peter Squire, and, though he had elsewhere expressed his feelings with regard to him, he might again say that their sympathies were with his family in the loss they had sustained. Many of them were able to rejoice at what he as one of the founders of the Society in common with others had done, and it was right that he as one of the young generation should bear his testimony to the value which ought to be attached to those services. They had also to regret the loss of two honorary members, and since the Report was printed they had also lost another, M. Wurtz. Both that gentleman and M. Dumas had delivered the Faraday lecture in London, and possibly some members of the Society might have come in contact with them; but it was certainly an honour to have had on their roll for so many years the names of those two distinguished men. They had also lost Professor Balfour, whose special services to the members of the North British Branch were greatly appreciated. He would conclude by moving that the Report now read be received, adopted and printed in the Journal of the Society's transactions.

The VICE-PRESIDENT seconded the motion, and as no one rose in response to an invitation to make any remarks upon it, it was at once put and carried unanimously.

The PRESIDENT then called on Mr. Giles to move the resolution of which he had given notice to the following effect:—

> "That the Council of the Pharmaceutical Society be requested to consider and report upon the best means of promoting systematic Pharmaceutical Research. either by the institution of a Laboratory and Staff devoted to that purpose, or by such other means as may, after full investigation, appear best calculated to effect the object in view, which shall primarily be the initiation, examination and improvement of contemplated or existing formulæ of the National Pharmacopœia."

Mr. GILES said he should introduce this resolution by making one or two assumptions which would shorten the remarks he would afterwards have to make. In the first place he assumed that all members of the Society were in accord with the principles upon which the Society itself was founded and that they desired to promote scientific pharmacy. In fact what was pharmacy if it was not scientific? what right would they have to call themselves the Pharmaceutical Society unless they desired to promote pharmacy which according to his reading meant scientific pharmacy? Next he assumed that all would agree in the efforts that the Council had recently been making to establish the claims of the Society to have a recognized *locus standi* in the body charged with the preparation of the National Pharmacopœia. Those two assumptions were really of necessity associated, because no pharmacist could claim to be represented on the Pharmacopœia Committee unless he also desired to promote scientific pharmacy. He would assume, therefore, that he might argue from these premises in favour of the resolution he had the honour to propose. But first of all he would say a word or two on its form and substance. He should like also to say that from circumstances over which he had no control, he had not been able to give that amount of attention and preparation to this matter which would enable him to present it in such a satisfactory, connected and coherent manner as he should have liked. As to the form of the resolution, although it did make allusion to a laboratory and staff devoted to the purpose of pharmaceutical research, it in no wise tied the hands of the Council to that or any other method of attaining the objects in view. He confessed he did not see any other way in which it could be attained, but he did not profess to have all the wisdom in the world, and possibly the Council might see some way of attaining the desired result without the institution of a laboratory. As to the substance of the resolution, on analysing it, it would be found to essentially consist of two propositions—first, that pharmaceutical research was the natural foundation of a scientific Pharmacopœia, and next, that pharmaceutical research was the province of pharmacy—*voilà tout.* Well, if that were so, it appeared to him the resolution was established beyond the power of contradiction. If pharmaceutical research were necessary to the formation of a Pharmacopœia, and it was the province of the Pharmaceutical Society to promote pharmaceutical research—that was all the resolution said, unless they were prepared to deny that the Pharmaceutical Society was responsible for fulfilling those obligations which unquestionably did not rest on any individual pharmacist. They had no right to demand of any given pharmacist that he should devote his energies to pharmaceutical research. If he did so, so much the better, and all honour to him; but the individual duty of the man was the practice of pharmacy, scientifically, honourably and well, and there was no duty incumbent on him to occupy his time for the common good in the prosecution of pharmaceutical research. He was disposed to think that in pressing the claim which the Society made on the authorities to be associated in the manufacture of the Pharmacopœia, the Society had been a little disposed to overlook its own obligations, and it was that conviction which had led him to bring forward this proposal. It was all very well when they went outside and discussed the matter to sink all questions of shortcomings, and to press their claims strongly; that he had done himself when opportunity offered; but in that room they were meeting in council amongst themselves, and it would be most profitable to scan carefully the position, to determine the weak points and to amend them, so that when the time came they might go with an unbroken front to those whom they had to satisfy and have no weak points in their armour. He took it that none but practical, scientific pharmacists were competent to prepare a Pharmacopœia which should be level with the advances of medical and pharmaceutical science throughout the world; in fact, that was pretty well admitted by those who were charged with the duty of making the Pharmacopœia. They did not attempt to conceal their own unfitness for the task imposed upon them. That was patent, because they delegated it to someone else, in violation of the principle *delegatus non potest delegare.* He thought that gave them a correct starting point and it rested with them to do all that was necessary on their side, and then the claim which pharmacists had to be represented on the Pharmacopœia Committee, in this country as they were in all others, would be absolutely irresistible. This question was undoubtedly the question of the hour. He made no reflection on the Society for any apathy in the past of which he did not believe it had been guilty. It had dealt wisely with questions as they had arisen and had done much, which had put it in the position to do more. It had evoked organization out of chaos. It had provided for and ultimately compelled the technical and scientific education of its members, it had obtained for them such an amount of legislative protection as no other analogous body enjoyed, but it had not yet reaped all the reward it was entitled to for its labours. It had not yet succeeded in enfranchising its members, for pharmacists and agricultural labourers were

the only unenfranchised subjects of Her Majesty, since they had no voice in the laws by which they were bound. Pharmacists demanded that they should not be bound by a codex which they had no hand in preparing, but which they were really the only persons concerned in carrying out. The time had now arrived when it devolved on the Society through its Council to take a new departure, but immediately this was proposed it raised a chorus of feeble opposition. There was a sort of idea that what you did not do yesterday you had no right to do to-morrow, and that what had not been done formerly it was impossible to do in the future. He had no sympathy with that idea. But he had heard a whisper that the suggestion he made, although a laudable kind of thing, which might probably lead to some interesting discussion, was nevertheless quite impracticable, and that if any such laboratory as he suggested should be organized, there would be nothing for it to do. Now, what did this sort of objection mean? did it mean anything more after all than that it would cost some money? He admitted it would cost money, but he did not see the use of money except to expend it wisely. If they could gain any adequate advantage by spending money, or undertaking extra trouble, it was very desirable to enter on the course proposed although it might involve a new departure. Societies could not remain long in a state of inaction; they must either be growing and flourishing, or decaying. Whether that Society had done growing he did not know, but it certainly had not come to the decaying period. He believed it was flourishing, and as a feature of its vigour it ought to put out every year new branches, new leaves, and new vigour, and that the time had now arrived when its inflorescence should take the form which he was now indicating, namely, taking up that which did not offer itself at first to such a Society, but which came in due course afterwards, the prosecution of pharmaceutical research. Education came first; they had to learn what other people knew, but after that it was their duty to develop something new from which other people might learn. If it were necessary to say anything on the subject of what this laboratory should do, without attempting anything like an exhaustive list, he might refer to two or three subjects of investigation. For instance, under the head of drugs there were the different qualities of drugs, the source from which they were derived and the different species of plants, as, for instance, the cinchona bark, opium, aloes, and many others; the investigation of the purity of commercial drugs and chemicals with convenient tests for adulteration; and the investigation of the relative quantities of active constituents in various parts of the plant and the different periods of growth were very much needed. Under the head of preparations there were tinctures, with reference to their alcoholic strength, the modes of exhaustion in making galenical preparations; and the standardizing of galenical preparations, a new feature, which had already been suggested in the pages of the Journal and was likely to afford great scope for original investigation. Then there was the separation and estimation of alkaloids and glucosides, etc., in drugs, and their estimation in galenical preparations; the bases for ointments; new remedies, ascertaining their active principles, and the best mode of preparing them for medicinal use, and publishing provisional formulæ with a view to uniformity. They all knew that when anything new came out there was the greatest possible range of strength, and nobody going into one pharmacy after another could be sure that he would get the same thing; hence discredit was often brought on pharmacists in consequence of there not being any quasi-official formula by which they might be guided. Then it might be said *cui bono*? what advantage would the Society derive from this procedure? First of all it would promote scientific pharmacy. That was a general statement, but a very important one, and unless the Society was prepared to go back in all its teaching, that ground alone would be sufficient to justify it in taking some steps in this direction. But more than that, he took it this was the right course and the most probable course to strengthen the claims of the Society to be represented in the Pharmacopœia Committee. The present aspect of things was entirely in favour of a change. The Medical Council in seeking to frame the Pharmacopœia had gone admittedly to the most competent persons, and who were they? The professors of pharmacy and the sciences contributory thereto in their own institution. The organization of the Society had been turned to its prejudice; the engineer had been hoist with his own petard. He made no reflection on the professors; there was not a man within or without the Society who would have done differently under similar circumstances. At all events the fact remained that the Medical Council went to men who might reasonably be supposed to have had the most experience in pharmaceutical research, which was probably true; but, nevertheless, they were not practical pharmacists, and, unfortunately, although this was a compliment to them it reflected no credit on pharmacy; it did not put pharmacy in the position in which it ought to stand, but left it under the reproach that it was unfit to be the handmaiden of medicine, unfit to meet the professors of medicine on common ground in a co-ordinate capacity. That was a bitter reproach, and the sooner it was swept away the better. Who could do this except that Society? The point had not been sufficiently insisted upon,—for it was the most important point,—that there was no organization except that Society which represented pharmacy. Pharmacy could not make its voice heard except through that Society, and the duty of every pharmacist was to stand by the Society and not to go outside and raise up rival societies which could not occupy the same ground, that would never be listened to in the same way, and never could do the good for pharmacy which that Society could do, and had done, in raising pharmacists really from an untaught mob to a scientific body.

Mr. Hampson objected to the word "mob."

Mr. Giles said the only difference was they had not quite so much coherence as a mob. He did not use the term in any sense as a reproach; he was one of the mob himself. But still if anyone objected to the term he would withdraw it. He commended this resolution to the meeting, and hoped it would be discussed freely. He was quite sure it would be approached in the right spirit, and though no doubt they might differ in details there were no details insisted upon. This would be only an additional reason for referring it to the Council to consider the details and bring forward something on which they could ask the opinion of the members. He believed nothing so much as this could improve the position of pharmacists in the estimation of the world, tend to their being ultimately associated in a co-ordinate capacity with the medical profession in a Pharmacopœia Committee, and help to raise to its proper status the calling of a pharmaceutical chemist, so that he should be regarded, as he really was and ought to be, a member of a scientific body.

Mr. Urwick said he would second the resolution in order that it might be fairly discussed. There were many points in Mr. Giles's remarks which must commend themselves to every pharmacist. They always wanted a standard when new tinctures or preparations were produced. For want of that each one made a form of his own, and, perhaps, his neighbour made another, and the result was that prescriptions were brought back as being not quite the same as had been obtained elsewhere, there being sometimes a difference of colour, of strength, and so on. It would be very advantageous to the trade if a laboratory were established where investigations could be carried on, and some standard published to guide in the preparation of new remedies, which now frequently became the property of one particular house, to which all had to go when the thing was ordered, or, if it was worth

while to make it themselves, differences of strength were the result.

Mr. MARTINDALE moved as an amendment that the sentence beginning "which shall" at the end of the resolution be omitted. He thought if Mr. Giles would accept it in that form it would remove a difficulty which appeared to him to exist at present, because the resolution was almost an acknowledgment that practical pharmacists were not able to give any information or to support the Medical Council in the work they had undertaken. If that were omitted it would still meet the wishes of Mr. Giles, and leave the Council a little more free to act when the resolution came before it. As Mr. Giles had pointed out there was a want of original research, for, until comparatively recently, there had been little in the way of practical pharmaceutical education. During the past few months there had been some valuable papers in that direction, which would tend no doubt to strengthen the hands of the professors who were now preparing the new Pharmacopœia; but still it left pharmacists in a very invidious position as compared to that held by their brethren in other countries. They were in the position of traders and knew best how to prepare their goods to suit the market; unquestionably they could make preparations to suit physicians and surgeons who wanted to use them better than anyone could tell them, and they knew much better for the most part the character of the drugs they had to deal with. In fact, if any medical man wished to give directions how to make a preparation, he would have to come to a practical man first to learn how it was to be done, and then having got that information would be able to give it to others. That was taking information from a source and not acknowledging it. He was rather in hopes that Mr. Giles would have brought forward some suggestion for a Fellowship of the Society, which he thought might be a great service, to be tenable for three, four or five years, with a certain income attached to it to be devoted to the purposes of investigation. If one hundred and ninety-nine chemists would give £5 each, he would give another to form a fund of £1000, from which, with the aid of a similar grant from the Council, £40 or £50 a year might be derived to endow a Fellowship. If that were done it would be a means of attaching the old students to the institution for a few years, and they would be able to do good work, not only for the whole body but for themselves. It would be an honourable position, both while it was held and afterwards, and might to some extent prevent what often occurred now, their best students leaving pharmacy and going into other work, which they found paid better.

Mr. HOWARD HALL seconded the amendment.

Mr. GILES said if it would at all meet the sense of the meeting he would agree to strike out the latter portion of the resolution, though he preferred it as it stood.

The PRESIDENT said he thought it would be better to have the whole subject open for discussion, including both the original resolution and the amendment.

Mr. LONG was very glad to find there was no burning question before them at the present moment and thought this proposition was an extremely good one. They had to lament their unfortunate position in having their rights entirely ignored, for neither their rights as traders nor yet as scientific men were acknowledged. It was not at all advisable to allow themselves to sink into the position of mere traders, and no ordinary commercial men, if called upon at times, as pharmacists were, to do the work they had to do, could possible do it, but for those services they got no compensation at all. He thought the founding of a laboratory, and a system of pursuing scientific investigation, would help forward, very substantially, their claims to assist in the preparation of a Pharmacopœia. Of course this would involve a certain amount of money, but they had quite enough money now, and it was no use heaping up money which would do no actual good. It was a question with him whether it would not be desirable so to extend the laboratory that chemists might go there and supply themselves with all those preparations for which they had now to go to special houses.

Mr. WHITTLE agreed with Mr. Giles's proposal, but thought it would be hardly worth while to spend money on research if they were to be ignored, as they were at present, on the Pharmacopœia Committee, for, in fact, they were in no better position, if so good, as twelve months ago. He hoped now the Council would speak with no uncertain sound on this matter. The Pharmacopœia belonged as much to them as to the Medical Council, but medical men had come to their back door to get assistance instead of coming to the front. He objected to their always going hat in hand asking for concessions when they ought to insist on their rights. Chemists should put some enthusiasm into the matter, and when the Medical Council saw they were determined to be represented they would give way. He was not opposed to education by any means, but what was the use of young men spending money and working up to pass different examinations when they really got no equivalent for it?

Mr. CROSS (Shrewsbury) said Mr. Giles had introduced a most important question, but he feared there were many present to whom, like himself, it came rather unexpectedly, and he thought it would be very useful if they had some expression of opinion from the Council as to their views upon the matter. No doubt the Council had paid some attention to it as it was a very important thing which would interfere with the internal management of the house, and probably they had formed some opinion upon it. He did not agree with Mr. Giles that it was altogether a new departure, and should rather call it a fresh development, but he should like to hear the views of some members of the Council before any further discussion took place.

Mr. HAMPSON said it was very gratifying to find that in the twelve months which had elapsed since the last annual meeting Mr. Giles must have considered that the calibre of the Council had altered, or else he would not place in its hands such a very important matter. There was no question that the resolution now proposed was very important, and he would recommend the members to exercise the greatest possible caution in forming an opinion upon it. In one sense it was distinctly a new departure, because the resolution asked the Council to consider this matter, and report upon it, which would appear to show that there still lingered in his mind some want of confidence in the Council that it had not hitherto done its duty. He thought it had, and he made bold to say that the cultivation of pharmacy was quite abreast with the times, though it was not utilized to its fullest extent of development by their medical friends. He shared Mr. Giles's strong desire to develop pharmaceutical research. What intelligent man could have any other opinion? But, on the other hand, the establishment of a committee, which would really be the result of the resolution if carried, would be most inopportune at present. Let them wait until the Medical Council recognized them on the Pharmacopœia Committee. If they looked through the Journal for the last few years there was plenty of material, and there were plenty of men capable of occupying a substantial position on any committee and to carry out as much scientific pharmacy and further research as it was necessary to meet any possible demands which medical men were likely to make. He did not oppose the resolution from any spirit of antagonism, but he thought it reflected on the Society. Its real meaning was that they had not done their duty in the past. What had the Pharmaceutical Conference been working at for many years, but pharmaceutical research; had they not voted funds year after year for the purpose?—and there was even a difficulty in appropriating the money. How were they to find a number of men to carry on this work, when no demand was being

made upon them. Once let their position be properly recognized and there would be plenty of men to carry on all the research which was necessary.

Mr. NAYLOR said he largely sympathized with the observations made by Mr. Hampson. It seemed to him not at all flattering to them as pharmacists to be told that if they desired to be represented on the Pharmacopœia Committee some day they must attain that *locus standi* by paying a certain number of men to investigate subjects directly bearing upon their own interests, and the production of a British Pharmacopœia. He regarded that as a confession of weakness, and thought it was very illogical to come there year after year and complain of their lack of social position, and what not, and at the same time to say, here we are, why are we not represented on the Pharmacopœia Committee? If this resolution were carried they would be simply showing that the great majority were totally inadequate to the carrying out of the task, and were not fit to be entrusted with it. The resolution proposed to carry out a very important object, but he could not agree with the way in which it was proposed to be done. Mr. Giles had made a comparison between pharmacists on the Continent and themselves. He was not personally acquainted with the matter, but he should like to know whether they had become recognized by paying a certain number of men to do such work, or to acquire a certain amount of knowledge, or whether it was not due to the fact that as a body they were better educated. Moreover, Mr. Giles had largely overlooked the efforts of pharmacists in the past and in the present. Was not the present Pharmacopœia indebted to the pharmacists of the past, and would not the Pharmacopœia of the future be indebted to the research and careful investigation conducted by pharmacists of the present day? There was no doubt it would, although it might not fall directly into their hands to do it. It seemed to him that if they continued their investigations and continued to show that they possessed the necessary knowledge the time was not far distant when the Medical Council would invite their co-operation in this very important task.

Mr. SCHACHT said he should have been very glad, if he could have done so with a free conscience, to have endorsed this project. The motive was so clearly to stimulate them in the right direction that he felt some pain in being obliged to oppose it; but it was more in form than in substance that he differed from Mr. Giles, and he hoped to show that he was perfectly reasonable and logical in approving of the general principles, but not of the mode in which he wished those principles to be urged forward. He did not charge him with having any *arrière pensée*, but still the resolution seemed something like pledging them by a side wind to a principle which had not yet been admitted. They were not yet at all pledged to the promotion of systematic pharmaceutical research, and he hardly thought that Mr. Giles had sufficiently considered the full import of those words. Systematic pharmaceutical research was a very different thing from anything the Society had ever attempted before. As he understood the words he did not mean doing that which they had been accustomed to do, promoting scientific research indirectly, which up to the present time had been the limit of their obligations. Mr. Giles said there was no obligation on any individual pharmacist to investigate difficulties, but strangely enough he seemed to think that because there was no obligation on an individual there was an obligation on a multitude of individuals forming the Society. It seemed to him that there was no more obligation on the Society than there was on an individual member, for this reason, pharmacy was an integral portion of the medical art; it was not an independent science at all, it was simply pharmacy because it was associated with medicine. Now if they, as a part of the profession of medicine, could co-operate with other portions of the medical art for the investigation of medical subjects, well and good; but it seemed to him, as Mr. Hampson had said, that they had done their share, and that any shortcomings which existed came from the medical side proper rather than from the pharmaceutical or purely scientific. If there is one thing he should rejoice to see more than another it would be some organization which should be instituted primarily from the higher domains of medicine, the object of which should be the investigation of the conditions of the application of remedies to disease. As far as he knew no such attempt had ever been made systemically. Individuals had attempted to do this, and had more or less succeeded, but where was there any medical organization which set that duty before itself? Let anything like an approach be made to them for co-operation in such an enterprise, and then would be the time to begin to think about the systematic prosecution of pharmaceutical research. Then the difficulty incidentally arose in his mind, who is to determine what should be investigated? Mr. Giles had formulated a number of things which he thought it desirable to investigate. He (Mr. Schacht) might have as many more, and everyone else would have their own ideas to which others might object. What were those opinions worth medically? Absolutely nothing. If anything were to be investigated on the responsibility of a society it must be those subjects which the scientific medical world declared to be the proper subjects of inquiry. Then the standardizing of preparations had been referred to; but what was the use of his idea of a standard? He had no right to such an idea other than to such an one as they could all form in the shape of putting so many grains of a definite chemical into a definite solution; but he could not standardize a pharmaceutical preparation, because there was not any medical authority which had determined the medical value of any one of the things he was going to standardize. Let medical authority somewhere or other declare that such and such questions wanted to be settled, and then they might undertake to settle them, but they were required by this resolution to pledge themselves to a course which would carry them beyond what had ever been attempted by other sections of the medical art, and, therefore, it seemed to him to be premature. That was the chief objection he had to the resolution. He should like to know if any other scientific society had come to such a conclusion as this. There were many ways in which chemical observation could be be effected, but he knew of no organization which said, Here is such and such an amount of money devoted to the development of science in the abstract, nor did he know how this would constitute advance with regard to the Pharmacopœia. If the Medical Council chose to elect professors engaged in that school as experts, why should not they employ the very men who would be appointed to carry out these investigations in the same way. An investigation committee might be chosen from the rank of experts; they could hardly consist of men engaged in business. But their rights were that as practical pharmacists they should be consulted, and at the present moment their claims were at least equal to those of the medical gentlemen sitting on the Committee.

Mr. EKIN regarded this proposition as being not so much premature as inopportune, and had no doubt many would have a difficulty in voting upon it on that ground. While he heartily sympathized with Mr. Giles in the suggestion that there should be a distinct effort to promote scientific research, he feared that any effort of that sort at the present time would be misunderstood. It was a pity it should be so, but there was no doubt about it. Many of the difficulties Mr. Schacht had raised were after all only difficulties of detail. There would be no difficulty in finding subjects to investigate, and if anything of the sort were ever carried out the Council would probably nominate a certain number of their own men, possibly associated with an equal number of others, who would choose the subjects. There might be a practical difficulty in finding suitable men to carry them out, and

the more one thought about it the more one realized how great those practical difficulties would be. At the same time there was no reason why they should be insuperable. With reference to one point mentioned by Mr. Giles, the probability or the possibility was that almost every different drug should be treated by a different strength of spirit, instead of their all being treated with one or at most two strengths. That was a very important work which no one individual could undertake, but which might be taken up by a society. It was quite practical, and would be very useful, and would be to the credit of the Society. At the same time he felt that if this resolution were carried now, it would be very much misunderstood.

Mr. LUFF cordially agreed with the assumptions with which Mr. Giles prefaced his remarks, and he presumed all the other members would do the same, for it was not only desirable that the Pharmaceutical Society should be officially represented as regards the construction of the Pharmacopœia, but they had a right to demand that position. Mr. Giles saw that their body was wandering in the wilderness of official Pharmacopœia neglect, and this resolution was to him a pillar of cloud by day and a pillar of fire by night which should lead them to the desired Canaan of official Pharmacopœia recognition. But, much as he sympathized with that, with one part of the resolution he could not agree, and that was the introduction of a system of co-operative research work, a system which would very much imperil if not entirely destroy the existence of individual research. It would be putting forward a forced and exotic plant in place of the strong indigenous plant of private individual work. He did not say that all men engaged in research would put forward this objection; but would there not be many who would say, Why should I spend trouble and time in doing work that is provided for by the Society in its official laboratory? Mr. Giles saw no other way of accomplishing the result, but with all deference he would point out another. If it were necessary that an additional incentive should be given to pharmaceutical research it might be done by offering good prizes for essays on certain subjects which were supposed at the time to specially require investigation. In that way a number of good papers would be obtained which would be adjudicated upon by the Committee, and the prizes awarded to the best men. But certainly if the majority of members present did not wish to give a crushing blow to individual research they might amend the resolution by suggesting that the Council be requested to consider the advisibility of offering prizes for researches.

The VICE-PRESIDENT thought they were much indebted to Mr. Giles for having brought forward this subject. In one sense there was great opportuneness in it, although it was inopportune in another, for it came before them at a time when their thoughts were prominently directed to their recognition in connection with the National Pharmacopœia. That question would be shortly before the House of Commons, when he trusted the collective energy of the members of the Society would be put forth to such a degree as would compel recognition. His own impression was that there was an almost entire consensus of opinion amongst the profession as to their rights. One or two medical men on the previous evening had expressed to him their astonishment that their claims had not been conceded before. He took it Mr. Giles wished them to direct their attention especially to pharmaceutical works, though he used the phrase original research, which covered a much larger extent of ground. But he differed from him as to his suggestion for a laboratory, which he feared would, as had been pointed out by Mr. Luff, tend very considerably to repress individual energy.

The PRESIDENT said this matter had not come before the Council in such a way that any definite conclusion had been come to, because it was felt desirable to hear Mr. Giles's interpretation of his own resolution. He would remind the meeting that it was not necessary to discuss details at the present moment; the first point was, did they want to commit the incoming Council to set to work on these lines? and if so, was this the best time to do it? Every educated pharmacist must thoroughly concur in the spirit of the resolution, but he did not think it was at all opportune, and should have much preferred if it could have been kept altogether from the public gaze for another year or two. It had two aspects, one, the simple one in which Mr. Giles presented it, that of true pharmaceutical research, and no doubt there was a great deal of good work which might be done in various ways without stifling individual energy. There was a deal of work which could only be done in such a way as had been sketched out; for instance, such a matter as was referred to by Mr. Ekin could not possibly be done by individuals. Nevertheless he did not believe that providing very great facilities for research necessarily tended to promote its advancement. But he would rather not discuss those details; the object of the resolution evidently was to move the Council on to advance pharmacy. But the present Council, and he was quite sure the incoming Council, was anxious to do so, and it had power to do all that was required without coming to the Annual Meeting for instructions. Requests made to a public body, either to the Conference or to the Society, with regard to original work in pharmacy had been practically few and far between. As to the institution of medals, prizes and things of that kind, he did not think they would be so satisfactory as the plan Mr. Giles recommended. But the resolution had another aspect, and that was a political one. There was a certain Bill now going through Parliament which deeply interested them, and in that aspect it was unfortunate that the resolution should have come forward. As it had come forward he was bound to ask the members to reject it, unless Mr. Giles, as he hoped, would withdraw it, not because they disapproved of it, but because it was most distinctly inopportune. He thought Mr. Giles might very well content himself with the expressions of opinion he had heard, and with the fact that there was likely to be on the new Council a certain number of men who entirely sympathized with him in spirit. They might depend upon it that when the time came he for one should not be slow to move in the direction he had referred to. There could be no better way of spending money than in the promotion of the object contemplated; but because at that particular moment such a resolution would perhaps be misunderstood, and might have a bad effect on the minds of the medical profession, and might even be regarded by some of their own body as somewhat of a slur on the Council, he would ask the meeting to join with him in urging on Mr. Giles and Mr. Martindale to withdraw both the motion and the amendment.

Mr. GILES said he would at once respond to that request, and he could only say that if he had had any idea of this objection the resolution would never have seen the light. He had not the slightest idea that he was acting contrary to the wishes of the President, or he would not have moved in the matter, and, in fact, he had expressed a wish to see the President before the notice was published, but had not been able to do so. He had heard quite enough to satisfy him that this motion would have better success in his hands than it would in his own, and he was quite content to leave it there. One or two things had been said which were a little debateable on which he would not enter, and would only say this, that the observations made might be divided under two heads, those who went against the laboratory part of the scheme, which was merely an incidental suggestion, those who went against the resolution; but if he dismissed all who went against the laboratory, which was merely an incidental matter, he did not know what there would be left to answer.

Mr. LOMAS thought sufficient notice had hardly been

taken of the slight put upon members of the Society by the way in which the new Pharmacopœia was being prepared. If he was rightly informed the Committee had come to the professors of the Society, and having done so he thought it was rather remiss of those gentlemen not to have mentioned the President and Council of the Society as being the most proper persons to assist them in the forthcoming Pharmacopœia.

The PRESIDENT said he had reason to know that that course had been recommended by the professors; but it was obviously not within their power to compel those who were engaging them as professional experts to follow their advice.

Mr. MARTINDALE having expressed his willingness to withdraw the amendment,

The PRESIDENT said it was very gratifying to find both gentlemen so ready to accede to the suggestion made. The Council had already shown that it was capable of dealing with large questions and of spending money when required on good objects. When the opportune time came no doubt the then Council would face this question in the best interests of pharmacy. Although it was important that they should be represented on the Pharmacopœia Committee, he hoped they were not going to neglect pharmacy because they were not so represented. It would be their duty to advance pharmacy as much in the future as they had endeavoured to do in the past, and by all available means.

Mr. VIZER asked if any approach had been made to the medical profession itself with regard to the Pharmacopœia Committee. The Bill was now in the House, and it seemed to him a very opportune time to make their influence felt amongst members of Parliament who at the present time might be anxious to do what they could to support them. He believed if the medical profession were directly approached by the agency of the local secretaries they would receive a large amount of support.

The PRESIDENT said this idea had not been lost sight of, and they were preparing to make use of their medical friends in the way suggested. In fact, last August something was attempted in that way, though, unfortunately, very few medical men were then in town.

Mr. URWICK suggested that deputations should wait on members of Parliament; a deputation told better than letters, and letters better than printed forms.

Mr. SYMES said when they were getting signatures last autumn on this question, forms of petition were prepared for signature by medical men and he obtained some. He spoke to a great number of medical men on the subject and did not remember one who disagreed with the view he put forward; but when he presented the petition he found very great difficulty in getting signatures, because they did not like to sign anything which appeared to be against the wishes of the Medical Council.

Mr. MACKENZIE said this question of representation on the Pharmacopœia Committee was really the burning question of the day. He had hardly any faith in getting much through the medium of medical men, and would rather advocate going direct to members of Parliament. Last year, a deputation waited on the Scotch members, when he was told by a very prominent member, the highest legal authority in Scotland, that if they wanted to get what they had a right to have, and which he was surprised they had not, they must try to influence their individual members in counties and boroughs. He said that he would use his influence with his friend who had charge of the Bill, and he could not see how a reasonable man could refuse to grant their request. This appeared to be a very opportune time for pressing this question upon the various members of Parliament.

Mr. WARD (Sheffield) endorsed the remarks of Mr. Symes with regard to the difficulty of getting medical men to sign petitions. As local secretary he waited on the leading physician in Sheffield last year, who expressed much sympathy with his object; but when he presented the petition he told him he was pledged to the present Bill, and could not sign anything against it. After that, of course, he knew it would be perfectly useless to go to any other medical man in the town.

Mr. ALLEN said his experience was quite the reverse of that of Mr. Symes and Mr. Ward. He had taken occasion to call on a few practitioners in London and obtained signatures from all, except one, whom he called upon.

The PRESIDENT said there was no doubt the sympathy of the medical profession was with them, and where signatures were refused it was from the fear that in signing a petition of that sort they would be opposing their own Bill, and medical men were naturally anxious not to interpose any difficulty in getting that Bill through Parliament.

The VICE-PRESIDENT remarked that with regard to this question of approaching medical men, no doubt experiences had been diverse, but the great value of the signatures of medical men was to influence members of Parliament.

Twenty-five gentlemen were then appointed scrutineers of the balloting papers.

Mr. GILES then proposed a vote of thanks to the President for his courtesy in presiding on that occasion, and to the Council for the manner in which they discharged their important duties during the past year.

Mr. HOWARD HALL seconded the motion, which was carried unanimously.

The PRESIDENT called attention to the registers placed upon the table, pursuant to Act of Parliament.

The meeting then adjourned until Friday at 12 o'clock, to receive the report of the Scrutineers.

ADJOURNED GENERAL MEETING.

Friday, May 23, 1884.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The adjourned meeting for receiving the report of the Scrutineers was held on Friday, May 23.

The Chairman of the Scrutineers read the following report:—

SCRUTINEERS' REPORT.

We, the undersigned Scrutineers, appointed at the Forty-third Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

Voting papers reported by the Secretary to have been issued	3672	
Voting papers received	1287	
Voting papers issued but not returned		2385
Voting papers received		1287
Voting papers disallowed:—		
Informal	18	
Received by post too late	62	
	—	80
Voting papers registered		1207

Result of the Poll.

Atkins	1092	Robbins	899
Schacht	1067	Butt	863
Greenish	1044	Squire	855
Savage	1036	Borland	848
Radley	988		
Woolley	985	Shapley	594
Gostling	980	Young (John R.)	551
Churchill	974	Dyer	524
Young (Jas. R.)	951	Baldock	510
Williams	943		

GEORGE S. TAYLOR, *Chairman.*

Chas. J. Mead.	Chas. B. Allen.
Edwd. B. Stamp.	W. Pickabd.
I. Bourdas.	Jas. T. Tupholme.
David Hooper.	J. W. Bowen.
J. Horncastle.	M. Mitchell Bird.
Alfred E. Tanner.	Philip Princep.
Robt. Rowe.	Pelham C. Maitland.
W. H Symons.	John Morris Broad.
Geo. F. Bindloss.	Wm. Gulliver.
Wm. Matthews.	Henry Mathews.
T. Edwd. Greenish.	R. Fisher Young.
Robt. Saml. Bathe.	T. Howard Hall.

The New Council.

The Chairman then declared that the following gentlemen would constitute the Council for the ensuing year:—

Andrews, Frederick, 34, Leinster Terrace, Hyde Park, W.

Atkins, Samuel Ralph, Market Place, Salisbury.

Borland, John, 7, King Street, Kilmarnock.

Bottle, Alexander, 37, Townwall Street, Dover.

Butt, Edward Northway, 13, Curzon Street, Mayfair, W.

Carteighe, Michael, 180, New Bond Street, W.

Churchill, Walter John, 46, New Street, Birmingham.

Gostling, Thomas Preston, Market Hill, Diss.

Greenish, Thomas, 20, New Street, Dorset Square, N.W.

Hampson, Robert, 205, St. John Street Road, E.C.

Hills, Walter, 225, Oxford Street, W.

Radley, William Valentine, 42, Hampton Road, Southport.

Richardson, J. G. F., Elmfield, Stoneygate, Leicester.

Robbins, John, 147, Oxford Street, W.

Savage, William Dawson, 4, Park Road East, Brighton.

Schacht, Geo. F., 52, Royal York Crescent, Clifton, Bristol.

Squire, Peter Wyatt, 413, Oxford Street, W.

Symes, Charles, 14, Hardman Street, Liverpool.

Williams, John, 16, Cross Street, Hatton Garden, E.C.

Woolley, George Stephen, 69, Market Street, Manchester.

Young, James Robertson, 17, North Bridge, Edinburgh.

Auditors.

There being only the requisite number of candidates (five) for the office of Auditors, the Chairman declared the following duly elected for the ensuing twelve months:—

Hodgkinson, William 198, Upper Whitecross Street, E.C.

Hopkin, William King, 16, Cross Street, Hatton Garden, E.C.

Lescher, Frank Harwood, 60, Bartholomew Close, E.C.

Stacey, Samuel Lloyd, 300, High Holborn, W.C.

Watts, William Manning, 32, Lower Whitcross Street, E.C.

The meeting concluded with a vote of thanks to the Scrutineers for their services.

BOTANICAL PRIZE FOR 1885.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom, between the first day of May, 1884, and the first day of June, 1885; and should there be more than one collection possessing such an amount of merit as to entitle the collector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing sufficient merit to justify the Council in awarding medals or certificates, none will be given.

Competitors must be Associates or Apprentices or Students of the Society, and under twenty-one years of age.

The collection must consist of phanerogamous plants and ferns, arranged according to the natural system of De Candolle, or any other natural method in common use, and be accompanied by lists, arranged according to the same method, with the species numbered.

The collector must follow some work on British botany (such as that of Babington or Hooker), and state the work he adopts. The name of each plant, its habitat, and the date of collection must be stated on the paper on which it is preserved.

Each collection must be accompanied by a note, containing a declaration signed by the collector, and certified by his employer, or a pharmaceutical chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1884, and the first day of June, 1885, and were named and arranged without any other assistance than that derived from books.

In estimating the merits of the collections, not only will the number of specimens be taken into account, but also their rarity or otherwise, and the manner in which they are preserved, and should a specimen be wrongly named, this will be erased from the list.

The collection must be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1885, indorsed "Herbarium for Competition for the Botanical Prize." After the Prize Distribution in October, collections will be retained one month, under the care of the Curator of the Museum, for the inspection of persons connected with the Society, and then returned to the collector, if required.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly stated meeting of this Society, was summoned for Wednesday, May 7, at three o'clock, but did not take place, owing to there not being a quorum present. Six members, including the President and Vice President, attended; but as the regulations require that no business shall be transacted unless seven members be present, there was no meeting.

Chemists and Druggists' Trade Association of Great Britain.

The Annual Meeting of this Association was held on Tuesday, the 20th inst., at the Inns of Court Hotel. The proceedings commenced as usual with a

MEETING OF THE GENERAL COMMITTEE

at 11 o'clock. Mr. John Harrison (Sunderland), President, in the chair.

The Secretary read several letters from members re-

gretting their inability to be present, one of which made some remarks as to the financial management of the Society and the mode of audit, which were explained by Mr. Haydon.

The Report, of which the following is an abstract, and Financial Statement were taken as read.

The Report of the Executive Committee stated that the Association had successfully defended three of its members in the law courts during the past year in summonses issued against them under the Sale of Food and Drugs Act. The cases, which were referred to in detail, have already been published in this Journal. Since the last Annual Meeting the Executive had been compelled to refuse to defend one of the members in proceedings under this statute, on account of his having refused to accept the sealed sample of the drug purchased when offered at the time of purchase by the inspector. The Executive therefore took the opportunity of again impressing upon all members of the trade the advisability of invariably accepting samples when offered by inspectors under the Act, as refusal to do so places them in a very unfortunate position in the event of proceedings being commenced, and may, as in the case referred to, prevent the Association placing the services of their solicitor at the disposal of the defendant. During the past year proceedings had been successfully taken by the Association against four persons residing in Birmingham, London, Oldham, and Peterborough, for infringements of the 17th section of the Pharmacy Act, and it was stated that since the formation of the Association in October, 1876, the solicitor and officials had succeeded in convicting thirty-six illegal traders residing in all parts of the country under that section of the Act. Full reports of the hearing of these cases have appeared from time to time in the trade journals. Cases of illegal trading in poisons are, however, frequently brought before the Executive in which the requirements of the 17th section of the statute as to the labelling of the article have been complied with. In such cases the Association is powerless to institute legal proceedings against the offender under the 15th section for the sale of such poisons, power to sue under that section being, by the provisions of the Act, vested solely in the Council and Registrar of the Pharmaceutical Society. The Report then went on to say that no statute directly affecting the interests of chemists and druggists had been passed since the last Annual General Meeting, but the Exccutive had, nevertheless, given watchful attention to the proceedings of Parliament. The Bill introduced into the House of Lords last Session dealing with the amendment of the Medical Acts had been again brought into that House and passed during the present Session, and would probably at an early date be placed before the Commons. No action had been taken on the part of the Executive in regard to this Bill, as it contains no provision inimical to the trade, and expressly stated that:—"Nothing in this Act contained shall in anyway prejudice or affect the lawful occupation or business of chemists, or druggists, or, so far as relates to selling, compounding or dispensing medicines, the rights, privileges or employment of duly licensed apothecaries in Ireland." A Bill to restrict the sale of patent medicines had been introduced into the House of Commons in February last, by Mr. Warton and Dr. Farquharson, but was thrown out on the second reading by a large majority. In accordance with the instructions contained in a resolution passed by the last Annual General Meeting of the members of the Association, the Executive had considered the advisability of approaching the Council of the Pharmaceutical Society, with a view to united action in support of an amended Pharmacy Bill, and at their meeting on September 7th last, instructed the Secretary to write to the Secretary and Registrar of the Pharmaceutical Society, to arrange an interview between the Pharmaceutical Council and a deputation from the Executive of the Association before the introduction of such a Bill into Parliament. An interview was arranged, and took place on November 6th last. The proceedings, at the request of the President of the Pharmaceutical Society, were not reported. At the interview, a long discussion took place on the amendments proposed by your Executive to the draft Pharmacy Bill prepared by the Pharmaceutical Council, when it was ascertained that the Council had already settled the lines of the measure with the Privy Council. At the subsequent request of the President of the Pharmaceutical Society, the President and Vice-President of the Association again met the Law and Parliamentary Committee of the Pharmaceutical Council in reference to the matter, and eventually the Executive, at a meeting held on February 8th last, passed two resolutions to the effect that a small deputation should be appointed to accompany a deputation from the Council of the Pharmaceutical Society to the Lord President of the Privy Council in support of legislation on the general basis of the Bill now in the hands of the Government, and that the deputation should consist of the President, Vice-President, Mr. Barclay and the Secretary. These resolutions were in due course communicated to the Secretary and Registrar of the Pharmaceutical Society, who subsequently received a letter from the Privy Council Office, stating that Her Majesty's Government had decided to confine the Bill which they proposed to introduce to the question of the sale of poisons, and not to include in that Bill any amendments of the Pharmacy Act in relation to the status or the organization of the Pharmaceutical Society, and that the Lord President, after the Government Bill had been introduced, would be willing to receive a deputation on the subject. In compliance with a resolution passed at the last Annual General Meeting directing that a memorial, signed by the officers of the Association, should be presented to the House of Commons in support of the claim of pharmacists to be associated with members of the medical profession in a legally constituted committee for the purpose of preparing the British Pharmacopœia, and instructing the Executive to take such steps as they thought desirable in the matter, a petition had been drawn up and presented to the House of Commons by the Right Honourable Joseph Chamberlain, President of the Board of Trade, and a print of the same had been transmitted to all Local Secretaries of the Association, with a circular, asking them to request their parliamentary representatives to support its prayer in the house. Two cases having come under the notice of the Executive in which members of the Association had been threatened with prosecutions by the Inland Revenue authorities for having sold, as finish, methylated spirit, said to contain an insufficient quantity of gum resin, although the members themselves maintained that the spirit, when sold, met the requirements of the general order of the Board in that particular, the Executive applied for an interview between the Commissioners of Inland Revenue and a deputation from the Executive Committee of the Association, for the purpose of urging upon the Inland Revenue authorities the advisability of issuing an order making it compulsory on excise officers when purchasing spirit for analysis to leave with the seller a portion of the spirit sold. The Commissioners of Inland Revenue having expressed their willingness to receive the deputation, an interview took place and the Vice-Chairman of the Board, promised that the wishes of the deputation should be complied with. A General Order to that effect had since been issued to Excise officers throughout the country. At the Annual Meeting of the Scottish Branch, ten members had been nominated and duly elected by the Executive at their meeting held on May 21st last. The Executive regrets to report that the strength of the Association had declined during the past year, the total number of members on the Register at the time being 3340. It was thought there was no doubt that this was attributable to the severe and long continued depression in trade, which had so seriously affected

many societies depending for support on voluntary contributions. The financial statement would show that 2632 annual subscriptions, and £68 13*s.* in donations have been received during the year, as against 2743 annual subscriptions and £63 4*s.* 6*d.* in donations during the previous financial year. The total expenditure during the same time had decreased from £903 9*s.* 3*d.* in the financial year, terminating April 15th, 1883, to £774 10*s.* 9*d.* during the present financial year.

The financial statement from 16th April, 1883, to 15th April, 1884, was as follows :—

Receipts.

	£ s. d.	£ s. d.
Balance brought forward from last Account, viz. :		
Balance at Lloyds' Banking Company, Limited, Deposit Account	479 12 9	
Ditto in hands of Treasurer	18 1 0	
	497 13 9	
Deduct Balance due to Bankers on Current Account . 211 16 10		
Law Costs, unpaid 26 9 6		
	238 6 4	
		259 7 5
2632 Subscriptions at 5*s.* each		658 0 0
Donations		68 13 0
Interest allowed by Bankers on Deposit Account less Interest and Commission charged on Current Account		1 12 5
		£987 12 10

Payments.

	£ s. d.	£ s. d.
Advertisements		4 16 0
Auditors' Charges		12 12 0
Canvassing Expenses		4 19 2
Hire of Room for Public Meetings		4 15 0
Law Costs, viz. :—		
Solicitor's Charges	42 15 8	
Ditto Travelling Expenses	20 9 0	
Witnesses' Charges and Expenses	42 17 3	
		106 1 11
Office Expenses, viz. :—		
Cleaning	2 1 0	
Gas	7 17 5	
Rates and Taxes	8 9 4	
Rent	26 0 0	
		44 7 9
Postages		69 9 4
Reporting		43 8 9
Salaries, viz. :—		
Secretary	150 0 0	
Assistant Secretary	85 15 0	
Clerk	18 6 0	
		254 1 0
Stationery and Printing		58 4 8
Sundries		15 9 1
Travelling Expenses, viz. :—		
Executive Committee	125 2 7	
Secretary	25 1 6	
Assistant Secretary	6 2 0	
		156 6 1
Balance carried forward to next Account, viz. :—		774 10 9
Balance at Lloyds' Banking Company, Limited, Deposit Account	491 14 6	
Ditto in hands of Treasurer	11 19 3	
	503 13 9	
Deduct Balance due to Bankers on Current Account 266 5 10		
Law Costs, unpaid . . . 24 5 10		
	290 11 8	
		213 2 1
		£987 12 10

Mr. Urwick moved the adoption of the Report and Financial Statement. He said the only thing to be regretted was that members of the trade did not support the Association better. If it were not for that Association chemists and druggists would often be in a very unfortunate position, the Pharmaceutical Society not seeing its way to defend persons who were prosecuted, though it appeared to him that it might fairly subscribe towards the expenses of such cases.

Mr. Mackenzie (Edinburgh), in seconding the motion, said chemists and druggists ought to look upon this Association as a peace of mind insurance society, and it was a great pity it was not more appreciated.

Mr. Cross (Vice-President) said the value of organization was not sufficiently understood amongst chemists; but it must be remembered that they were engaged in an onerous occupation, which demanded their constant attention, and this led them to let outside things alone. The difficulty which both the Pharmaceutical Society and their own body had always had when dealing with the constituted authorities was that they did not directly represent the whole body of chemists, only a fractional part being subscribers. When this Association was started, the idea was to enlist the whole body in the kingdom, the subscription being fixed at the lowest point with that view. The result though favourable was not so much so as was hoped, and to-day, after several years' existence, they stood in a worse position than they did to begin with. Still, though it was disappointing, he saw no reason for despair; he believed there had been no time when chemists had been more harassed and worried than they were now, and it seemed to him, therefore, inevitable that they would awake to their own interests and the necessity of protecting them. If any burning question were to arise, no doubt they would quickly respond, and the apparent apathy would disappear. The Report was very interesting, and he hoped it would be carefully studied; the only matter to which he would specially refer was the proposed legislation. The Executive had discussed this matter with the Pharmaceutical Council under the gravest sense of responsibility, and as those very moderate proposals had not been accepted by the Government, he hoped a much stronger Bill would be brought forward and pushed to a successful conclusion.

The President, in putting the motion, made a few remarks on the financial position of the Association, which was not at all satisfactory, the expenditure having exceeded the income. He wished to draw special attention to the large amount of subscriptions in arrear, and hoped that the members of the Committee would each in his own district endeavour to get these arrears paid up; if this were done there would be a surplus on the year of over £100. He must take exception to the remark of the Vice-President that the Association was in a worse position than when they began. They were certainly poorer, but they were not worse, for they had a history behind them and could show for the money which had been expended, a large amount of work. If, as Mr. Mackenzie had suggested, the Association secured peace of mind to the members, it did an immense good, and perhaps it was the sense of security which prevailed which accounted for the apparent apathy which they all deplored.

The motion was then put and carried unanimously.

Messrs. Laird, Bingley and Arblaster having been appointed scrutineers of the ballot papers for the nomination of the Executive,

Mr. Ellinor (Sheffield) moved that the Committee recommend for adoption the amendment in Rule 6, of which Mr. Jervis had given notice, viz., that Rule 6 be amended to read as follows :—"The Executive Committee shall consist of twenty-four members, to be elected by ballot at each Annual Meeting. Five members to form a quorum. It shall be the duty of the General Committee to prepare and recommend to the Annual Meeting a list of the names of members to serve on the Executive Committee for the ensuing year. A President, a Vice-President, a Treasurer and an Honorary Secretary shall be elected by and from the Executive Committee."

Mr. Mackenzie seconded the motion.

Mr. Alderman Maltby opposed the motion on the ground mainly that it would detract from the interest felt in the Annual Meetings, if the election of President were not decided there. At the same time he should be

glad if nominations were made so that the members might know something more about the matter than they now did.

Mr. Urwick also opposed the motion, because he thought the present rule worked very well, and it was a pity to alter it.

Mr. Barclay (Birmingham) thought it desirable that as much power as possible should be placed in the hands of the trade; he was opposed to the Executive doing anything which could be done by the members at large.

Mr. Mackenzie asked, if a system of nominations were adopted as suggested, any one could be elected President or Vice-President who had not been nominated.

The President said he thought the existing rule would allow of nomination being made, as the decision would still remain with the members, and would be taken by ballot.

Mr. Symes (Liverpool) hoped Mr. Jervis would not press his motion.

The Vice-President (Mr. Cross) opposed the motion. He thought it better that the President and Vice-President should be able to speak as elected by a large constituency rather than as the officers of an Executive.

Mr. Vizer supported the motion.

Mr. Jervis admitted that the rule had worked well up to the present, but they had been very fortunate in their officers, and the same good fortune might not always attend them; and he contended that the Executive were much better able to select good officers than the members at large.

Mr. Hampson said he had been much disposed to support the motion at first, but on further consideration, and after hearing what had been said by other gentlemen, he did not think it would be opportune to press it at the present moment.

After a few words from the President in favour of the present state of things, the motion was put to the vote, and negatived by 11 votes to 4.

The Scrutineers having made their report, the Committee adjourned to the General Meeting.

General Meeting.

The Annual Meeting took place at half-past twelve o'clock, Mr. John Harrison, President, in the chair.

The attendance was somewhat meagre.

The Chairman, in moving the adoption of the Report, expressed his regret that the attendance was so small. He was very sorry to find that so few members found it consistent with their duties to be present at the Annual Meeting, when matters connected with the trade were to be discussed, and he was more surprised because from time to time they heard great injury was being done to the trade, and that united action was required, and yet when opportunity for discussing these matters and of providing a remedy was afforded only a small number availed themselves of it. It might possibly be said that this showed perfect satisfaction on the part of the trade with the work the Association was doing. If it were otherwise members would come to the meeting to call the Executive to account, so that the fact of their absence might be taken as indicating general satisfaction with the work which was done. A *résumé* of that work would be found in the Report, and he might say that every case brought forward which, in the judgment of the Committee, seemed to be one which should be defended had been undertaken, and he was proud to think that they had been so remarkably successful. It showed in the first instance that chemists had been unduly pressed by the authorities, and in the second place that the Executive exercised due care with regard to the case presented to them. It was not necessary to specify the particular nature of the case, but he might refer to one in which their old friend the milk of sulphur was brought forward. Probably the gentleman who brought it up must have thought that the Association was defunct or asleep, but with his usual ill-luck he had failed. If anything could prove more conclusively than another the necessity for such an institution, it was that now and again these cases would crop up, and he might very fairly say that if that Association were not in existence and prepared to defend members there would very soon be great cause for dissatisfaction. The Committee called attention, and very properly so, to one matter which had arisen probably in reference to these cases, viz., the refusal on the part of some chemists when a purchase was made for the purpose of analysis to receive the sealed sample, and he would urge on all members whenever this was done not to do so, because it placed the society in a great difficulty and the vendor also. He could understand that a man might feel so thoroughly in the right that it was like making himself an accessory after the fact to receive the sample at all; but that was not the way to look at it. He must remember that the reception of the sample enabled him to prove before an independent authority that the articles he sold were perfectly genuine, and it also showed that in his own mind he was so convinced that he had only done what was right that he was willing and anxious to retain a proof of it in his own hands. Proceedings had also been taken against traders in various parts of the country, which had been uniformly successful. Whenever the Committee had received information that illegal trading had been carried on, if they found there was a reasonable prospect of success in taking up those cases they never failed to do so. The next matter referred to in the Report was the proceedings in Parliament. First, in reference to the Bill which was introduced in the House of Lords last year for the amendment of the Medical Act, as it contained nothing prejudicial to their interests no action was needed. The second Bill was one for regulating the sale of patent medicines, introduced by Mr. Warton, but that came to an untimely end. The most important matter, no doubt, was the proposal for the amendment of the Pharmacy Act, and on that he should wish to say a few words. At the last Annual Meeting, a resolution was passed that it was desirable that united action should take place between the Pharmaceutical Society and themselves, if possible, to obtain such an amendment of the Pharmacy Act. The Pharmacy Act was then before them, and had received very full and fair discussion. Possibly had they been in possession of more information, that discussion might have been shorter, and much that was said might have been omitted; but they proceeded then on the principle that the measure was before them then for discussion, and were not aware that the details had been settled beyond all controversy. He then took occasion to remark that if these lines had been laid down by a superior authority, as a loyal subject, he should be prepared to accept them, but he was under the impression that the Bill had been brought before the Council of the Pharmaceutical Society in the character of experts who had been asked to frame a Bill for the better prevention of accidents by poisoning, and that they were asked to give their opinion as to what that method should be, and he considered the Bill then before them was the answer of the Pharmaceutical Society to that proposition. It was found afterwards that that was not the case; that although they had been asked to bring in such a Bill, they had also been restricted as to its nature, and that certain clauses had been inserted by a superior authority carrying out the views of the meeting. The Executive sought an interview with the Privy Council, when they learnt for the first time definitely the real state of the case. There was much in the Bill with which they did not both agree; there were several points on which they were in thorough agreement; there were some points they considered objectionable, while there were several others which they thought very valuable, for instance, the restriction of dispensing, and the sale of patent medicines containing poisons to chemists and druggists, and the proposition that the law should apply to companies

as well as individuals. These were matters of the greatest possible importance, and, therefore, although there were other points with which they did not agree, they felt it was a Bill which they ought to support, as those on which they differed were the very points which had been settled by a higher power. There were three courses open to them, either to assume the position of actual hostility, and to go to the Privy Council and to Parliament and oppose the Bill, tooth and nail; to take up a position of perfect neutrality, saying to the Pharmaceutical Society, We have had no part in framing this Bill, and you must take all the responsibility of it yourselves; or, thirdly, they might say that there was much in it which they agreed with, and, therefore, although there were other points on which they did not, they would support the Bill for the sake of the important advantages it contained. The Executive decided on the latter course, as he believed very wisely. He should not have liked to stand there to-day and have to excuse himself and his colleagues for the fact that no legislation was attempted when there was such a general feeling that legislation was required. He should not like to stand there in the character of an obstructionist, and, therefore, he accepted what was good and swallowed as best he could what he did not like. The lesson to be drawn from the proceedings which led up to the Act of 1868 ought not to be forgotten. That Act was rendered, to a large extent, useless by the divisions which existed in their own ranks, and that weighed very considerably with the Executive, because they felt that if they took up a position of hostility the Government would say, Here are two bodies, representing, to a large extent, the same people, coming to totally different opinions on the same question, and the result would have been that they would have said, "Gentlemen, you had better go home and settle these differences amongst yourselves, and in the meantime we will legislate as we think proper." What had actually taken place? Last year a bill was brought forward in the House of Lords with regard to a Pharmacopœia Committee and on that bill their claims were entirely ignored. The Council of the Pharmaceutical Society and their own Executive took measures to petition the House of Commons with a view to providing that chemists and druggists should be represented on that Committee. Nothing could be fairer in principle, and, in fact, it had been acknowledged to him by several members of Parliament that the claim appeared to be thoroughly reasonable, and that unless there was some very good reason to the contrary, it would have to be considered. Everyone seemed to think there must be something mis-stated or omitted, or their claims would have been recognized before. However, although they made this strong and joint representation, showing no division in their ranks, the Bill had been re-introduced and their claims were again ignored. To his mind, nothing could prove more conclusively the necessity for union, for if they were ignored when they were united, what would be their position when, on the one hand, the Pharmaceutical Society advocated one thing, and they, on the other hand, another? Their great necessity was organization. An old Hebrew hero was represented as saying, "Justice with courage is a thousand men;" but had he lived now he would have said, justice with organized force is a thousand men. Unless they were thoroughly organized and worked well together it was no use indulging in wild declamations as to nothing being done, for nothing could be done. But if they could go forward to the country and to Government and say they spoke in the name of ten thousand men who were determined to have justice done to them there would be a very different response. He hoped every chemist and druggist would bear in mind that if they wanted a Pharmacy Act which would be of any use, which would give them that justice which they had a right to demand, that demand must go straight to the Government from a united people. What was the extent of the support they received at present? They only spoke in the name of scarcely three thousand members. This was a sad reflection on the times and showed a want of appreciation amongst chemists which, to say the least of it, was disastrous to their interests. There was nothing else special in the Report to which he need allude, except one matter which was brought forward at the last meeting, the question of selling methylated spirit; that was brought forward in consequence of several complaints made with reference to the purchase of finish having been made which was found, after a considerable lapse of time, not to contain the quantity of resin which it ought, and the Executive were requested to seek an interview with the Inland Revenue authorities on the subject. In due time a special deputation waited on the authorities at Somerset House, where they were received with great courtesy, and so thoroughly convinced were the authorities with the few observations made by the deputation that they at once said they would recommend the Board to issue the order which was asked for. Nothing could prove more conclusively that if they could unite themselves together with the view of obtaining justice, it would not be long withheld. Another matter to which he wished to refer was the strength of the Association. That was discussed by the Committee on the previous evening, when it was pointed out they were strongest where there were active local secretaries, and he would, therefore, suggest that if there were any local secretaries present who were not active that they should either become active at once, or if they could not do so, resign in favour of someone else who could. Every man in his own district should bring the claims of the Association forward with the view to increasing their numerical strength, for it was only in that way they could go forward, and speak with power and effect.

The Vice-President (Mr. Cross) seconded the motion, and said he had very few remarks to offer except to emphasize what had been already said by the President. With regard to the works of the Association, both of attack and defence, the fewness of the cases which had been undertaken argued in favour of the policy hitherto adopted; for if the Association had not done its work well there would no doubt have been many more. But, in fact, there had been no cases come before the Committee which had not received full attention. With regard to the sealed samples also of articles purchased for analysis, however indignant an innocent man might feel, he should remember the object for which the sample was furnished to him, and also that his refusal to receive it might be attributed to very different motives. With regard to the revised edition of the Pharmacopœia the organization stood them in good stead, for although the result of their action was *nil*, he believed their position was considerably improved. Several members of Parliament were communicated with, and from personal interviews he had with them, he believed that the justice of their claims had largely impressed them, for when the time came the matter could be taken up where it was then left, and be carried on with success. With regard to the deputation to the Inland Revenue, it was very gratifying to hear Mr. Adam Young say that the Inland Revenue authorities wished as much as possible that the sale of methylated spirit should be in the hands of chemists and druggists, because they were a body of men in whom the authorities had confidence.

Mr. Whittle regretted the constant decrease in the numbers of the members of the Association, and was astonished to find that chemists did not to a greater extent support a society which they knew was so valuable and was ready to come forward at any moment and defend them when they were unjustly attacked. He feared, however, that too many of them did not care who paid the expenses so long as they did not, and fancied they were quite as safe as if they subscribed. He contended, however, that they were not safe in their present position, for the Association ought to have at least £500

to £1000 in hand. It would never do to take up a case which they could not go through with. He had never met a single chemist who did not think the Society had done marvellous work for the amount of money it had received; but, unfortunately, chemists and druggists were about the weakest specimens on the face of the earth, though if united they might do some good. Many of them were like the pendulum of a clock, they went from their shop to bed, and from their bed to the shop, and would never spend 5*s.* for anything unless they could get an immediate 7*s.* 6*d.* They lost the sale of patent medicines through the same parsimony; they wanted to have the privilege for nothing, and thought two guineas was too much. They got it down to 5*s.*, and now they had to a great extent lost the trade; and serve them right. It was the want of unity which was their great weakness. They would never get a Pharmacy Act which would do them any good unless they stood shoulder to shoulder and showed the public they were an educated body of men who had confidence in themselves. Many persons looked upon this Association as a sort of double of the Pharmaceutical Society, and all the more since several members of the Executive were also on the Council. No doubt those gentlemen worked well in both Societies, but it had occurred to him that it would be as well if the two bodies were kept more distinct, and if the members of their Executive were not members of the Pharmaceutical Council.

Mr. Walker (Coventry) said no doubt the remarks just made were intended in the most friendly spirit, but as a member of the late Executive he must say that those gentlemen who were also on the Council of the Pharmaceutical Society had been of the greatest possible use to the Trade Association, and instead of doing anything to suggest that they were simply nominees of the Pharmaceutical Society, they had always taken the greatest possible interest in trade matters, and had given many very valuable hints with reference to the possibilities of the train of thought which the Pharmaceutical Society might take on any given subject. Hence their presence, instead of being an element of weakness, had been positively a source of strength. With reference to the cases which had been taken up, as the President had said they had always done their best to take up a case when there was any chance of success, and that no doubt was true, and he might add that every case was carefully considered on its merits. Burns said we only know the evil done, but never what is resisted, and if members knew the number of cases which came before the Executive and which were carefully considered, they would feel sure that the Executive were not by any means deaf to the requests which reached them from all quarters. As a member of the wholesale trade he often heard reports that the Executive had not sufficiently attended to the interests of trade; that they had not taken up this, that and the other case. But he could only say that all such reports were founded on an entire misconception, and that if any case were not taken up there were very good reasons for it.

Mr. Hampson said he was one of those unfortunate members of the Executive who happened to be a member of the Pharmaceutical Council. He believed that the fact that members of that Council had also been on the Executive had been a decided advantage. It might not be without alloy, for there were very few things in this life free from alloy. He must express great satisfaction with the opening address of the President. It had an excellent ring of strength about it, and he hoped if it did not reach every chemist's shop in the kingdom it would at any rate reach a great many, and would meet with the response it deserved. He regretted that the meeting was so small, and also that the strength of the Association was not greater, but other organizations suffered from the same state of indifference. It was a universal complaint, but on the other hand it ought to make them more determined to utilize to the utmost the strength that they had. Although they were not numerous they were representative, and if they used the strength they possessed at the right time they would be able to make themselves felt. If he had any special interest with regard to this Association, it was that they should on all possible occasions work harmoniously with the Pharmaceutical Society. He knew that the Pharmaceutical Society was not without fault, that it had done many things which it ought not to have done, and on the other hand it had not done many things it ought to have done. But what was the cause? Just the same as they had to complain of there, the want of support from outside, the want of the invigorating agency which the members gave, and which ought to be given in a much greater measure to both Societies. On the other hand, the Pharmaceutical Society was a fact, its position was most important with regard to pharmacy, and this Association might on all occasions without loss of dignity unite with the older Society in carrying out all worthy objects. He was extremely gratified to find that within the last year the two Societies had approached each other. He might almost say they had shaken hands. At any rate there was a friendly feeling; the old feeling of distrust was gradually vanishing, and in a short time the two Societies might be able to work each in its own manner without any feeling of suspicion or jealousy. He was much struck with the point made by the President, when he referred to the fact that notwithstanding their united action with regard to the Pharmacopœia, they did not seem to have made themselves felt; to a certain extent that was true, but he believed they had made themselves felt. There was another Medical Bill in the House of Lords, and they would have another opportunity of exercising their power, and if they did so in conjunction with the Pharmaceutical Society he thought they might obtain a just recognition at the hands of the Legislature. If any other reason were needed for uniting and for increasing the strength of the Association, there was the fact that the Government were about to legislate with regard to the sale of poisons, for notwithstanding that the Pharmaceutical Society had had the ear of the Medical Department of the Privy Council, and had had numerous conferences, it had up to the present time utterly ignored their representations. That appeared to be a melancholy state of things, and they might have to oppose the Patent Medicine Bill; very likely they would. Surely that was another reason for uniting their strength and acting harmoniously with the elder body.

Mr. Mackenzie (Edinburgh) having been on the Executive from the very first, said he could speak with the fullest confidence as to the advantage which had been derived from the presence of gentlemen who were on the Council of the Pharmaceutical Society. At the early meetings they looked upon it as a fortunate day when they had the presence of those who were not sent from the Pharmaceutical Society to the Trade Association, but rather from the Trade Association to the Council of the Pharmaceutical Society, and if they would analyse the voting papers from year to year, he thought it would be found that those members who stood highest on the poll were not those who had least to do with the Trade Association, but rather the reverse. He hoped that any misunderstanding which might exist on that point would be corrected, and that these gentlemen would remain on both Boards for a long time to come. With regard to the Pharmacopœia they must cease to look to high quarters for patronage or support, and rely more upon themselves. Each of them represented districts widely scattered, from all of which members were returned to Parliament, and their influence would be best used by communicating directly with those members. After the last meeting he went to the House of Commons, and saw the Lord Advocate, who acknowledged that their position was a very strong one, and advised him to see other members, which he did, and explained the true position of matters, so that he believed they would get

a good deal of support when the time came. The day might not be far distant when these gentlemen would be wanting votes again, and that was a very favourable time to produce an impression upon them. If there were apathy in the trade he believed it arose from their success, and if they were to resolve to wind up the Association, there would be an immediate outcry all over the country.

Mr. Allen (Kilburn) remarked that though gentlemen from the country came up in great force the Londoners kept behind their counters and would not attend. One gentleman had alluded to the good which might be done by local secretaries, and he understood that the London Committee were considering whether district secretaries should not be appointed in London who should endeavour to induce more members to join. Almost the first paragraph of the report related to an important prosecution in the North of London, and with regard to that he might mention another good result of organization, which was not stated in the report. Three highly respectable members of the trade were summoned by the analyst connected with the Hampstead Vestry, but in each case, by the help of the *Referee* and the efforts which the Executive put forth, the prosecution broke down. Shortly afterwards a circular was sent round bearing the signatures of the three prosecuted members, referring to the fact that the appointment of the analyst was with them, and urging chemists and druggists in the neighbourhood to oppose his appointment. He appended his own signature and saw one or two members of the Hampstead Vestry on the subject, and the result was that shortly afterwards another gentleman was appointed.

Mr. Barclay said the past year was one in which they had been able to do very little, but they would have done more had their hands not been tied, to a great extent, by the Pharmacy Bill. He, for one, did not feel at all sorry that this Bill had received its *coup de grace*, and that they might now start *de novo*, for they might very easily get a better Bill than the one which was proposed to be introduced. Professor Attfield, whom he was glad to see present, in the remarkably able address which he gave as President of the Pharmaceutical Congress, had laid down some lines on which chemists might set to work to try to obtain legislation. The advantage which would have been obtained by the trade had the Pharmacy Bill passed in its entirety would have been but very small, and he thought if they boldly set to work and made up their minds as to what they ought to have, and go to the country and use their influence with members of Parliament and the public, they might do a great deal better than they had reason to expect from the past. Something had been said about organization, and they were supposed to know something about that in Birmingham; but he might say that Birmingham organization was powerful because of the large numbers at its back. It was easy to organize if you had numbers, but it was difficult and useless to obtain an organization if you had nothing to organize with. They ought all to endeavour to obtain a large increase of numbers in face of the legislation Government was about to introduce, which would probably not be very satisfactory, and, therefore, they might anticipate the necessity for fighting which would no doubt stimulate all the local secretaries to go to work. As the Chairman had said, they could not agree with the Pharmacy Bill on all points, but it was a question whether they should take it in its entirety, stand aside altogether, or oppose it, and they felt that they could not take the responsibility of dividing the trade, and hence they supported the Bill. He should be very glad if the meeting would come to some practical conclusions, so that the incoming Executive might be able to gather the opinions of the chemists throughout the country as to the lines on which they should endeavour to act. In the proposed Bill certain poisons were to be termed poisonous, and were to be allowed to be sold by anyone if properly labelled. This was a question which chemists ought to look at very seriously. He thought it would be a retrograde step altogether to allow other persons to sell poisons under these restrictions. If it were once admitted, the schedule of poisonous articles would be continually added to by the Privy Council, and chemists would in the end be seriously injured. The public mind was made up pretty generally to go for something more than the Pharmacy Bill had attempted, to give the chemists more powers, and to place around strong medicines, as well as poisonous medicines, restrictions in favour of chemists. He thought it would be well if a resolution were passed for the Executive to endeavour to obtain the opinion of chemists throughout the country as to the lines of a Bill, and to approach the Pharmaceutical Society, stating their views, and endeavour to arrive at harmonious and united language. They must be united if they were to do anything at all, but, at the same time, being a distinct association, they might help the Society a great deal more if they were allowed. It was quite impossible for the Executive to fight for a bill which was not its own, and it could only be its own if it commanded the sympathies of the Executive, which it would not do thoroughly unless the Executive had some hand in framing it. He was glad to find that the Pharmaceutical Society and that Association were more in harmony than they had ever been in the past, and trusted they would continue so, but if they were to pursue a common course and assist each other, there ought not only to be united action, but common ground on which they were to work. He was sorry to see that the strength of the Association had gone down, but still there was no need to despair. During the eight years of its existence something like £8000 had been raised, and a great deal had been done for it, and seeing these successes in the past he trusted chemists would not be so blind as to allow the Association to expire.

Mr. Symes, of Liverpool, feared some of the remarks made as to the numerical strength of the Association would look as if they were ringing its death knell, but he trusted that was not the case. He looked around to see what others were doing as the best means of bringing the trade together, and stemming the downward course which it seemed to be running. If they looked to the Continent they found that their pharmacy was more of a science, and was not so much regarded from a trade point of view, so that their experience would not be exactly applicable; but their brethren in America were very much in the same condition as themselves. They were harrassed by co-operative societies, and by certain black sheep amongst their own body who were known by the popular name of "scalpers." All sorts of means had been devised for dealing with these difficulties and for giving a healthier tone to the commercial character of pharmacy, and restoring something like a prosperous condition to the business. After proposing several methods of boycotting the persons who supplied these "scalpers," and forming co-operative societies amongst themselves, they had fallen back on exactly the same course as had been adopted in this country of forming a national trade association, in which the most substantial and most thoughtful men reposed the greatest confidence for getting over their difficulties. It seemed to him that just at the time when they had come to a low point in their history it was rather encouraging to find that people like the Americans, who were proverbially cute, could devise no better method than the one which had been adopted here for eight years for bringing the trade together.

Mr. Vizer remarked that fire insurance offices always regarded conflagrations as one of the best things which could happen to them, because when a large establishment was burnt down, a lot of small ones rushed in to insure. It seemed to him that they wanted something of the same kind in order to stir up their brethren to come

forward and join the Society. If he recollected rightly the Association had its origin almost in the embers of a large conflagration which occurred some years ago. He saw Mr. Haydon shake his head, but at any rate at that time a large number of chemists united in consequence of the great excitement that existed in order to meet a common evil. It seemed to him that when prosecutions were brought against chemists at the present time, disagreeable as it might be to the individual, it did good to the Association, because it led men to see there was danger ahead. When he was local secretary in Brighton, he took a great deal of trouble, and there was not a chemist in the town who was not either written to or spoken to on the subject; but the greatest obstacle he met with was the idea that there was no danger immediately threatening them. With regard to representation on the Pharmacopœia Committee, it occurred to him that something might be done by approaching the medical profession on the subject, for his experience was that as a body, they would support the presence of chemists upon that Committee. He thought if the medical profession were approached in the proper manner a great power might be brought to bear on the Government by which their end might be attained. He rejoiced at the harmonious spirit which existed between that Association and the Pharmaceutical Society, and there was certainly no reason why they should be antagonistic.

Mr. Haydon said he could not agree that the Association was founded on the embers of any other.

Mr. Diaper said in his view the Pharmacy Act Amendment Bill proposed by the Pharmaceutical Society was such an emasculated one that it was not worth supporting, but if they put forward one founded on the lines set forth by Professor Attfield it would be enthusiastically supported.

The President thought Mr. Vizer had rather confused the birth of that Association with the former one, the United Society of Chemists and Druggists. The origin of the Association really was the unfair prosecution by public analysts and the unfair attacks by the medical profession; these matters led to the formation of this Association for the reasons stated in rule 2, namely, "the protection of the legitimate interests of chemists and druggists from unfair attacks and encroachments and the promotion of their common welfare."

The resolution was then put and carried unanimously.

Mr. Jervis, being called upon to move the resolution which stood in his name, said that as there had been a considerable discussion on this matter in the General Committee, and as he found that the time had not come in the opinion of many members for introducing the amendment he proposed in rule 6, he should withdraw it.

Election of the Executive Committee.

The Secretary having read the following list of names which had been recommended by the General Committee for election as the Executive for the ensuing year, it was moved by Mr. Allen (Kilburn) and seconded by Mr. Kay (Stockport) and carried unanimously that they be elected.

Andrews, Frederick, London.
Arblaster, C. J., Birmingham.
Barclay, Thomas, Birmingham.
Bell, C. B., Hull.
Chapman, Henry. Scarborough.
Churchill, W. J., Birmingham.
Cross, W. G., Shrewsbury.
Davis, H., Leamington.
Ellinor, G., Sheffield.
Hampson, Robert, London.
Harrison, John, Sunderland.
Holdsworth, T. W., Birmingham.
Jervis, W., Sheffield.
Maltby, J., Lincoln.
Parker, W. H., Nottingham.
Pasmore, G., Exeter.
Southall, William, Birmingham.
Symes, Charles, Liverpool.
Walker, G., Coventry.
Williams, F. P., Manchester.
Yewdall, E., Leeds.

Scotland.

Ettles, John, Elgin.
Laird, G. H., Edinburgh.
Mackenzie, James, Edinburgh.

Mr. Alderman Maltby (Lincoln) begged leave in accordance with the opinion which had been expressed at the meeting of the General Committee to nominate Mr. Harrison as President for the ensuing year.

Mr. Barclay (Birmingham) seconded the nomination.

Mr. Bell (Hull) then nominated Mr. Cross as Vice-President, which Mr. Jervis seconded.

Mr. Hampson proposed and Mr. Andrews seconded the nomination of Mr. Southall as Treasurer.

Mr. Ellinor moved and Mr. Symes seconded the re-appointment of Mr. W. J. Churchill as Honorary Secretary.

Messrs. Lance, Whittle and Candy were appointed Scrutineers of the ballot papers.

During the examination of the voting papers Mr. Kay (Stockport) drew attention to the question as to the use of the royal arms, and stated that he understood that its legality would be tried: that although the Solicitor-General said that the prohibition of the use of the royal arms was not intended to apply to chemists who had it over their shops, he had reason to believe that the Lord Chamberlain believed it to be his duty to prevent its use as much as he could.

Mr. Symes said he had given some attention to this subject, and he believed the legal position to be this—the introduction of the clause in question arose from the fact of patent agents, especially, using the royal arms over their door as a means of misleading the public and inducing them to believe that they had some Government appointment. It was the determination of the promoters of the Bill in question to prevent such a thing being done; but as long as the arms were used merely as an ornament and not in any way to mislead the public, he thought there would be no danger of prosecution.

Mr. Andrews said there was no doubt the use of the royal arms had been much abused, especially in the neighbourhood of London, and it was much safer to discontinue it.

Mr. Allen suggested that it would be well for the Executive to watch the publication of the *Trade Marks Journal*, for he feared many labels at the present time were getting on the Register, which, to a certain extent, seemed to be limiting the use of the English language, and unless some body like the Trades Association took it upon themselves to watch the matter, it would be possible to register a name such as "Jockey Club," which would be very inconvenient to the trade at large. Some persons claimed the use of the word "tablets," which had been used almost from time immemorial, and he knew of persons having been threatened with prosecution for using that word.

Mr. Haydon said some four years ago he accepted the office of Secretary to the Birmingham Exchange and Chamber of Commerce, and in that capacity he had a great deal to do with trade marks. It was quite impossible for any such words as "Jockey Club" to become a trade mark. "Jenner's Liver Mixture" had been registered as a trade mark, but not simply the words, but in combination with a distinctive outline and device, and in the same way "Jockey Club" in a distinctive device might be registered, but the trade mark would not consist in the words "Jockey Club," but in the device which those words included. With regard to the word "tablets" having been registered by a firm who claim the exclusive right to do so he might say that they took pretty good care not to carry that contention into a court of law. The matter had been considered by the Executive, and if any member of the Association were threatened with an action for the use of that word he believed the Association would be prepared to defend him.

Mr. Barclay said it was possible formerly to register words as a trade mark, but now there must be a design.

Mr. Allen said that if any gentleman who was threatened upon such grounds would write to the Association he would be informed whether he had good grounds of defence or not. If the Association were to undertake the watching of the Trade Mark Register it would necessitate a vast amount of work, because it would involve the reading up and carefully indexing of the whole

of the marks already registered, which would be a work of great magnitude.

The scrutineers here reported that the following officers had been elected :—

President, Mr. John Harrison ; Vice-President, Mr. W. G. Cross ; Treasurer, Mr. William Southall ; Hon. Secretary, W. J. Churchill ; and, on the motion of Mr. Maltby, seconded by Mr. Laird, of Edinburgh, they were appointed accordingly.

The President and Vice-President having briefly expressed their acknowledgments of the honour which had been conferred upon them, the proceedings terminated with a vote of thanks to the President for his conduct in the chair.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

The Dissolved Oxygen of Water.

A lecture of some interest, owing to its relation to the sewage question, was delivered by Professor Odling before the Royal Institution on Friday, the 16th inst., under the title of "The Dissolved Oxygen of Water." Since the discovery of the weight of the atmosphere in 1640, and the difference in weight of the so-called fixed air, inflamable air and vital air, now known respectively as carbonic acid gas, hydrogen, and oxygen, Faraday has shown that the atmosphere is nothing else than the gas of a liquid, which gas by a sufficient abstraction of heat could be reduced to a liquid state. In 1823 he also reduced many of the known gases to a liquid state, and some tubes containing gases liquefied by Faraday were exhibited by the lecturer. Three methods may be used for the liquefaction of gases; by a lowering of the temperature, by pressure, or by making a solution with water, or a combination of these methods. The solubility of different gases in water was shown by Professor Odling in a tabular statement; at a temperature of 15° C., 2 volumes of hydrogen, 1½ of nitrogen, or 3 of oxygen are dissolved in 100 volumes of water, whilst 4356 volumes of sulphurous acid, 45,780 volumes of hydrochloric acid gas, or 78,270 volumes of ammonia are dissolved in the same volume of water. An increase of solubility is obtained with a reduction of temperature, though the rate of increase differs with the gas, that of sulphurous acid increasing at about five times the rate of that of hydrochloric acid. Professor Odling then stated that at a summer temperature of 70° F. water contained 1·8 cubic inches of oxygen per gallon, and 2·2 cubic inches at the winter temperature of 45° F., equivalent to four to five grains of oxygen per cubic foot. From calculations based upon this data it will be seen that at a temperature of 70° F. there are 2·58 tons of oxygen in every ten million cubic feet of water, increasing to 3·16 tons at the temperature of 45° F., thus showing a difference of over half a ton per ten million cubic feet between the summer and winter temperatures. It has been computed that during dry weather sixty four-million cubic feet of water pass Teddington Lock, which would contain seventeen and a quarter tons of oxygen; by the time this volume of water has reached Somerset House it is found to have lost from twelve to thirteen tons of the oxygen, which must have been taken up in the oxidation of sewage matter. In some experiments made by Dr. Tidy in June, the water from Teddington to Battersea showed an average percentage of aëration of 78, as compared with possible aëration; at Greenwich 38 per cent., and at Purfleet 26. Experiments carried on from July to November by Dibdin and Dupré showed that the percentage of aëration at Richmond was 86, decreasing to 40 per cent. at Woolwich, and as low as 24 per cent. at Erith, but by the time the water had reached Southend it had nearly recovered its first aëration, showing a percentage of 75. Dupré also made some experiments at Erith which showed a range of 50 percentage of aëration at high water to 40 percentage at low water, and results obtained by Dr. Tidy on the Colne confirmed these conclusions. It has been calculated that if a volume of water containing 35 per cent. of sewage matter be allowed to flow for one mile exposed to the air, the whole of the sewage would become oxidized. It has also been found by experiment that a closed vessel containing water with 5 per cent. sewage gives only 32 per cent. of aëration on the fourth day as compared with 84 per cent. on the day when introduced into the vessel. The results of these experiments tend to show that although no doubt the self-purifying power of the water of the river is sometimes overtaxed, it still retains the power of oxidizing the sewage matter, but the question as to whether it has the power of ridding itself of living bacteria still remains to be solved. During the lecture Professor Odling incidentally mentioned that the old method of ascertaining the quantity of oxygen present in water, by boiling in a vacuum and analysing the gas evolved, had been completely superseded by the use of a hyposulphite, introduced by Schutzenberger, of Paris. This compound not only acts as an oxidizing agent but also as a deoxidizer, speedily decolorizing indigo, magenta, iodide of starch, etc. As the colour is not destroyed until all the oxygen has been absorbed by the hyposulphite the amount of oxygen can be readily ascertained by the use of a burette.

Parliamentary and Law Proceedings.

Illegal Sale of Poison.

Before the county magistrates at Exeter, on Tuesday, the 20th inst., Thomas Elliott Pitt, agent and dealer, was summoned for selling half an ounce of strychnine, on April 20, at Kenton. Mr. Friend prosecuted and Mr. Brown defended.

Mr. Friend said that the proceedings were taken under the 31st and 32nd Vic., chap. 121, section 17, which stated that poison should be labelled when sold, and the person buying the same should leave his signature and address with the seller. On April 20, in consequence of the loss of a number of domestic animals, the police at Starcross had been spoken to on the subject. They made inquiries, and found that half an ounce of strychnine had been sold to a gamekeeper by the defendant, who is a grocer and ironmonger, and it appears that the poison was tied loosely to a packet of groceries which was sent to the gamekeeper. Mr. Friend did not know how it was the defendant was a chemist and grocer in one, but he was. The penalty for a first offence was £5, and in a second case £10.

Mr. Brown pleaded guilty on behalf of the defendant, and said that the gamekeeper had promised to come and sign the book, but he had failed to keep his promise, and the police had come upon the defendant. The bottle of poison had not been opened, and he asked the magistrates to dismiss from their minds the fact that animals had been poisoned through any act of the defendant.

The Bench fined the defendant £2 and £1 0*s.* 3*d.* costs.

ANSWERS TO CORRESPONDENTS.

David.—(1) *Vaccinium Vitis-Idœa.* (2) Probably *Achillea Millefolium*, but it is impossible to say with certainty with only a fragment of a leaf.

J. Humphrey.—(1) *Sanicula europœa.* (2) *Polygala vulgaris.* (3) *Poterium sanguisorba.* (4) *Orchis mascula.*

Australian.—The Board of Examiners has no power under the Pharmacy Act to accept the diploma referred to in lieu of any part of the examination.

Communications, Letters, etc., have been received from Messrs. Smith, Moore, Lloyd, Page, Bear, Bennett, Dymock, Shepperson, Brookes, Braithwaite, Christy, Foot, J. H. A.

FLETCHERS' Concentrated Liquors.

Opinions of Pharmacists.

From **Mr. D. S. EYNON, Dispensing Chemist,** LEAMINGTON.

I find the several **Concentrated Liquors** I had from you in every respect most convenient and satisfactory. The Syrups made from them are excellent.

May 5, 1880.

From **Mr. TOM WATERHOUSE, Dispensing Chemist,** UXBRIDGE.

I have thoroughly tested your **Concentrated Liquors**, and I cannot speak too highly of them. I now use them, to the exclusion of all other similar preparations, in my dispensary. They save time, are very reliable, and come as a boon to dispensing chemists. I get them regularly through my drug house.

July 8, 1881.

From **Messrs. THOMPSON & WALTON, Dispensing Chemists,** MAIDENHEAD.

You are aware we have, from time to time, supplies of your **Concentrated Liquors** from you. You will be glad to learn we have every reason to be satisfied with, and grateful for them. In our opinion, however anxious chemists may be to obtain what is termed 'accurate dispensing,' it is obviously impossible, in other than large centres, for them to supply, with reasonable assurance, the irregular and, it may be, small demand for the numerous Syrups prescribed now-a-days, except through agencies such as yours.

November 26, 1883.

From **Mr. H. HITCHMAN, Dispensing Chemist,** KETTERING.

I have used your preparations now for a considerable time with great satisfaction, more particularly the *Liq. Ferri Iodid.* and *Liq. Ferri Phosph. Comp.*, which form the best Syrups I have met with.

July 7, 1881.

From **Mr. S. LAWRENCE, Dispensing Chemist,** OBAN.

During the past year I have thoroughly tested most of your **Concentrated Liquors**, and have derived much satisfaction from their use, now finding my Syrups uniform in strength, appearance, and flavour; and as it is of the utmost importance that these qualities should predominate in all pharmaceutical preparations, I can confidently recommend your **Liquors** to all dispensing chemists.

Nov. 13, 1883.

From **Messrs. HOPWOOD & SON, Pharmaceutical Chemists,** RICHMOND.

We have much pleasure in bearing testimony to the very satisfactory results which we have always obtained from the use of your valuable preparations. We have now used the **Concentrated Liquors** for some considerable time, and have never once heard any complaint arising from want of uniformity in the result obtained, a state of affairs scarcely possible under the old method of keeping the ready-made Syrups.

November 9, 1883.

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2/3...Papier Fayard	13/6
1/1½... Ditto	7/
4/0...Papier Fruneau	27/
2/3... Ditto	15/
1/9...Pâte d'Aubergier	14/6
2/0... ,, de Berthé	16/
2/9... ,, de Coca	23/

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1/9 .. ,, de Nafé	13/
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7/0...Pierlot's Valerian	60/
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2/9... ,, Sirop Ferrug	27/
4/0...Racahout	30/6
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4/6... ,, Capsules	38/
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See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

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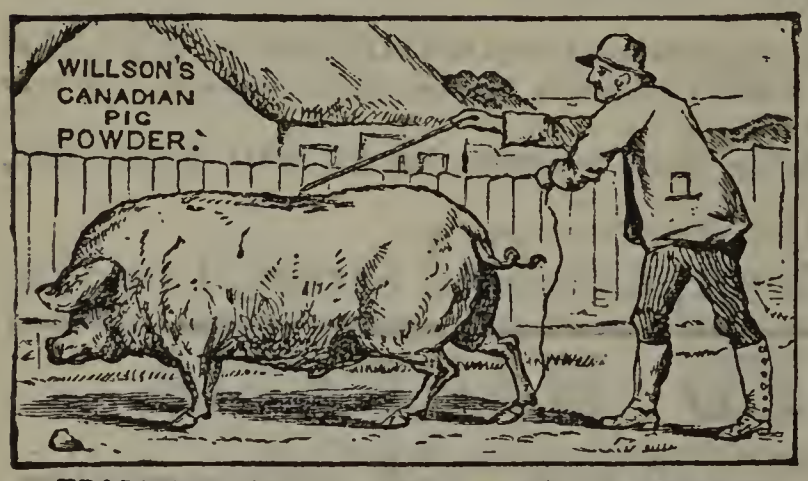

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"Superior to all Disinfectants and Antiseptics."
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SAPO-LINI, a Saponified Linseed Jelly; an excellent Toilet Soap.

All articles containing Scheduled Poisons are so labelled.

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RUBBER FACE TYPE,

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ARE SUPPLIED IN BOTTLES

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WITH PRINCIPAL USES, DOSE, AND REPETITION.

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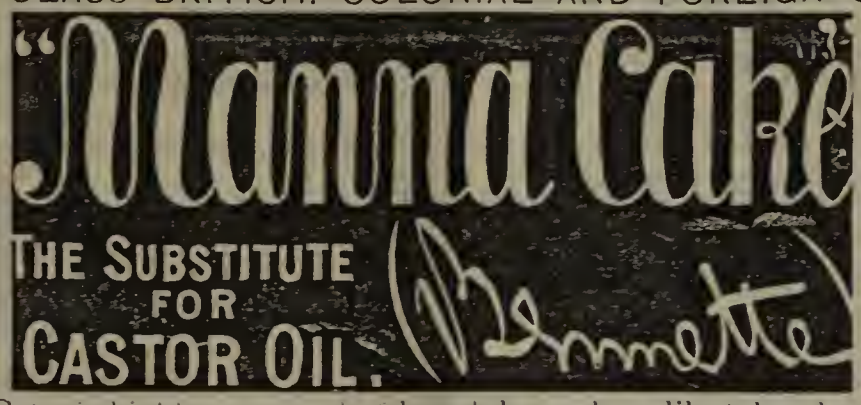

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The MANNA CAKE is sent out in Handsome Decorated Tin Boxes, suitable for display on the Counter

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The Godiva Modelling Composition

The above preparation since its introduction in 1870, has acquired a world-wide reputation, and is used by the Principal Dental Practitioners everywhere.

Full instructions for using the same are supplied with each box of Composition.

To be obtained at the principal Dental Depots established throughout the world, or from the manufacturer,

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(Prepared by the Daughter of the late John Bond.)

13 PRIZE GOLD AND OTHER MEDALS AWARDED.

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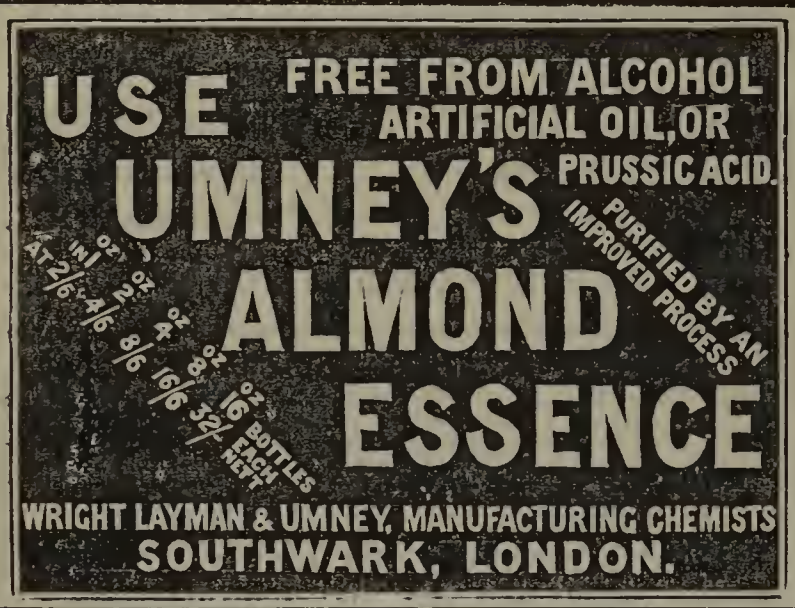

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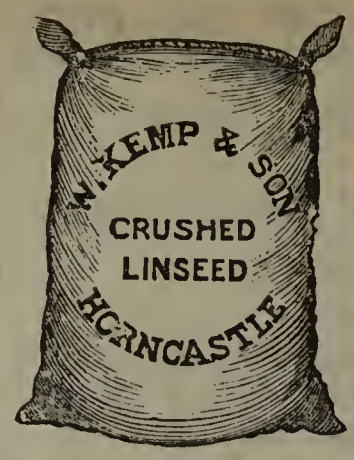

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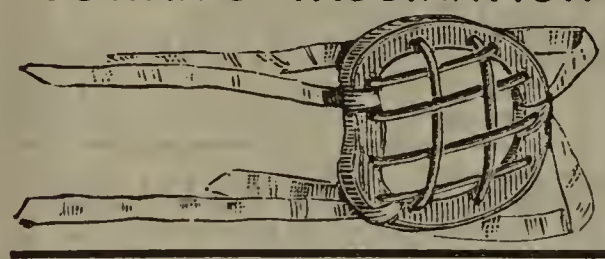

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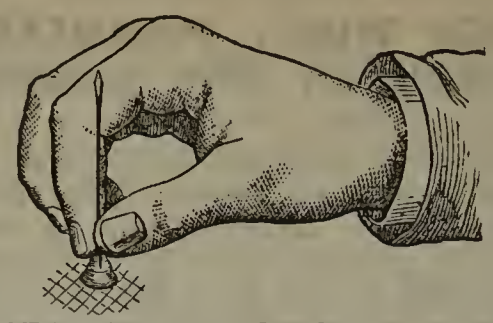

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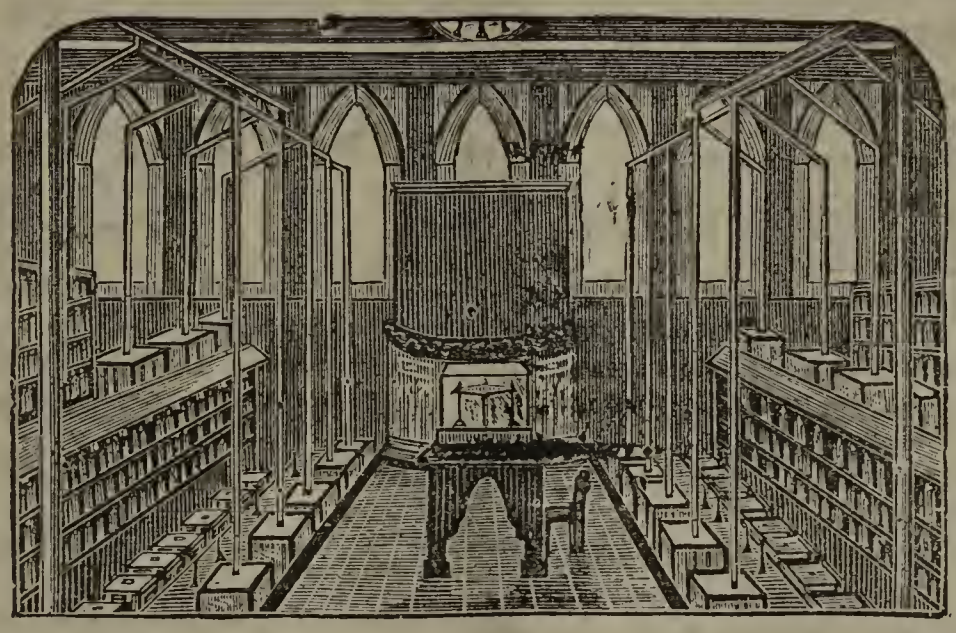

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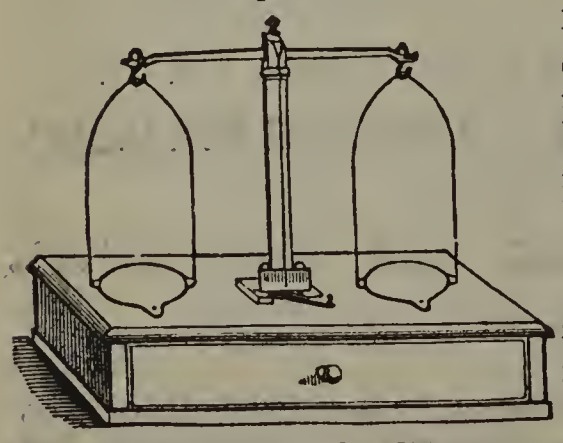

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MANAGER, qualified, as Chemist in a small country business. Must be able to Extract Teeth. Single. Unexceptional references absolutely indispensable. No other assistant. No Sunday duty. Moderate salary. Out-door. Apply, stating age, height, references, and enclosing photo., D. REEVE, Newhaven, Sussex.

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QUALIFIED MANAGER, with some knowledge of Dentistry. Must be a good Prescriber, and a thorough man of business, with undeniable references. Single. Age 26 to 30. One seeking a permanency required. Apply personally at 106, Kings Cross Rd., W.C.

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ASSISTANTS WANTED.

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GENUINE Dispensing and first-class Retail PHARMACY. In present hands 50 years. In a North Lancashire town. With an increasing trade. Present turn-over upwards of £2000. No agents treated with. Apply, DAVIES & CRANE, Chartered Accountants, Preston, Lancashire.

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The
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AND
Transactions.

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Hunyadí János

CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

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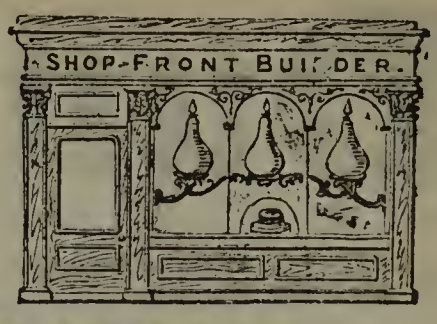

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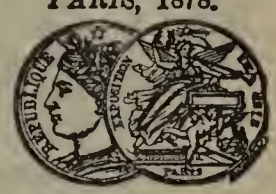

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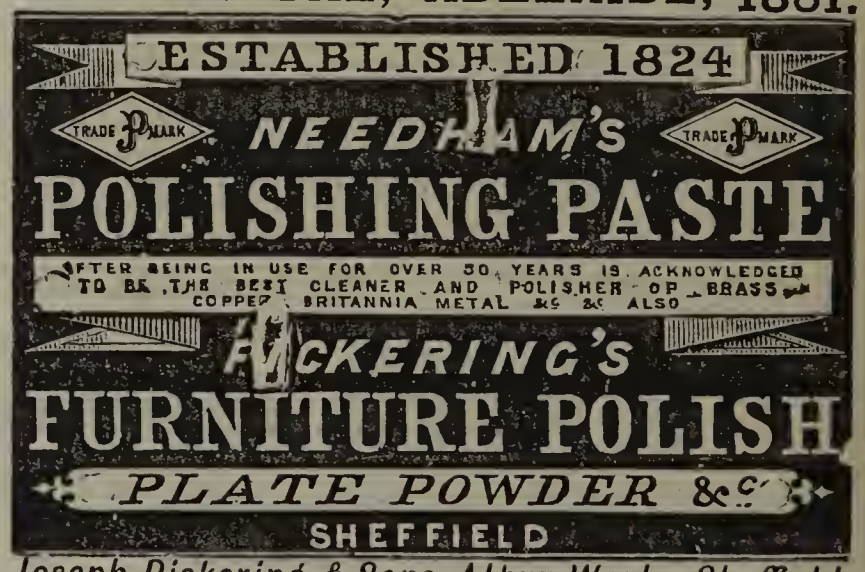

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ALLEN & HANBURYS'
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This is a finely granulated preparation, which in dissolving produees a sustained sparkling effervescenee, and a elear, bright solution. It possesscs all thc advantages of an agreeable saline, combined with the anti-fcbrile properties of Chlorate of Potash, of which it contains a considerable pereentage. It is, in short, an effieient aperient and febrifuge, and makes an exeeedingly pleasant and refreshing beverage.

PRICES. **THIS SALINE IS SUPPLIED IN BULK AT**

1s. 6d. per pound; **1s. 5d.** per pound for 14 pounds; **1s. 4d.** per pound for 112 pounds; or in ½-pound bottles (to retail at **1s. 6d.**) 11s. per doz.

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"The Kepler Malt, combined with Cod Liver Oil, is the most palatable and easily digested of any form we have yet seen for administering Cod Liver Oil."

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"THE MONTH."

Messrs. Heckel and Schlagdenhauffen have recently (*Comptes Rendus*, April 21, p. 996) investigated the chemical constituents of the bark known as "bois piquant" in Cayenne, and "clavalier jaune ou épineux" in the Antilles. The bark of this plant has been used for some years in the south of France, and particularly at Marseilles, as a febrifuge. It is derived from *Zanthoxylum Caribæum*, Lk., and *Z. Perrottettii*, DC., which is regarded by the authors as only a variety of the former. The bark has been described accurately by Guibourt ('Hist. des Drogues,' 6th ed.), who confounded it with that of *Z. Clava-Herculis*. It bears some resemblance to cusparia bark in appearance, but its microscopic structure is quite different. The authors have obtained from the bark a crystalline principle in colourless needles, soluble in alcohol, and represented by the formula $C_{12}H_{24}O$. It is not coloured by contact with concentrated nitric, hydrochloric or sulphuric acid, and melts at 285° C. The bark also yields an alkaloid in minute quantity, of which the formula is promised when a larger quantity has been obtained. It is prepared by digesting with water an extract made from the alcoholic solution left after removal of the crystals, treating the aqueous solution with lime, evaporating to dryness and exhausting the residue with boiling alcohol. This alkaloid is coloured bright red by nitric acid, but it differs from brucine in the fact that the nitric solution evaporated on a water-bath and treated with a drop of solution of stannous chloride does not assume a violet colour, while concentrated sulphuric acid colours it blue and an alcoholic solution of bromine gives with it a blue coloration lasting for a long time. The aqueous solution of the alkaloid in the dose of ·005 gram administered hypodermically to a frog caused a rapid general paralysis, the respiratory and circulatory functions gradually ceasing and death ensuing in half an hour. Similar effects were produced on guinea pigs and rabbits. The authors have also obtained from the bark a substance of resinous aspect (amorphous alkaloid?), of alkaloidal character and producing similar effects in similar doses. It is soluble in water. The bark itself gives, when macerated in water, a yellow, bitter, slightly acid infusion, which is turned brown by ferric chloride and a bright red by nitric acid, and gives yellow precipitates with mercuric chloride, stannous chloride, tannin, picric acid, the double iodides and phosphomolybdic acid.

Although boldo has been known to contain an alkaloid since 1876, when Messrs. Bourgoin and Verne detected boldine, the base was obtained in such a small quantity that it seemed doubtful if the medicinal properties of the plant were due entirely to it. This doubt has recently given rise to a fresh investigation by M. P. Chapoteaut (*Comptes Rendus*, xcviii., 1052), who has found that boldo also yields a glucoside. This is extracted by making an alcoholic extract of the leaves, treating it with water acidulated with hydrochloric acid, so as to completely eliminate the alkaloid, and after freeing the liquid from mucilaginous matter as much as possible, shaking it with ether or chloroform. On evaporation a syrupy transparent body is left, of a yellowish tint and having an aromatic odour and taste. A kilogram of the leaves yields about three grams of the glucoside. On analysis it gave results corresponding to the formula $C_{30}H_{52}O_8$. Heated with very dilute hydrochloric acid, it was found to split up into glucose and a body of a syrupy consistence, soluble in alcohol and benzine but insoluble in water, and represented by the formula $C_{19}H_{28}O_3$. The glucoside is considered by the author to be an ether in which glucose plays the part of an acid. The physiological effects of the glucoside have been studied by Dr. Laborde, who finds that when introduced into the body, either by hypodermic injections (tried on guinea pigs) or by the mouth (tried on dogs), it produces rapidly a tranquil sleep, lasting a longer or shorter time in proportion to the dose; from this sleep the animals awake in a natural manner and without any appreciable effect on their appetite, health, or habits. When subcutaneously injected into the dog, Dr. Laborde has observed that this glucoside excites and augments the secretory functions, causing an increase in the amount of bile, saliva, and urine. The results thus obtained seem to indicate that a very valuable addition has been made to the list of useful hypnotics and cholagogues. The bark of the shrub forms an article of commerce in South America, and it would, perhaps, be worthy of investigation if the glucoside be contained in larger quantity in it than in the leaves.

In a memoir published a few months since (*Journ. Ph. et de Chim.*, [5], viii., 5), Messrs. Regnauld and Villejean gave their reasons, based upon chemical analysis, for believing that the product at that time supplied to surgeons under the name of chloride of methylene was often, if not always, a simple mixture of chloroform and methylic alcohol. Subsequently, with a view of pursuing the subject physiologically, they prepared what they claim to have been pure chloride of methylene, the action of which was tested on dogs and other animals, comparative experiments being also made with chloroform. They report (*Journ. Ph. et de Chim.*, [5], x., 384) that the results confirm their previous belief and that the misnamed mixtures owe their properties to chloroform only. The physiological action of chloride of methylene was found to differ entirely from that of chloroform, except that both compounds produce insensibility. But the symptoms resulting from the inhalation of chloride of methylene (CH_2Cl_2)—contractions of the muscles, clonic movements, epileptiform and choreic seizures—were so constant and of such an alarming character that the authors think its employment as an anæsthetic during surgical questions is out of the question, and they doubt if it has ever been so employed.

In connection with this last expression of opinion, however, it may be mentioned that Dr. B. W. Richardson, in a note in the last number of the *Asclepiad* on the administration of chloroform and methylene bichloride, expressly refers to the contraction of muscular fibre produced by all anæsthetics of the chlorine series. This, he says, he is in the habit of counteracting by the administration of four to six fluid drachms of pure ethylic alcohol (sp. gr. 0·830) mixed with eight ounces of water, at a temperature of 95° to 100° F., about twenty minutes before the chloroform or bichloride of methylene is to be inhaled.

Ammoniated chloroform is recommended by Dr. B. W. Richardson (*Asclepiad*, p. 156) for the temporary preservation of *post-mortem* specimens. A fluid drachm is introduced into a wide-mouthed bottle of sixteen to twenty ounces capacity, previously filled with coal gas, and the bottle is then

closed with a stopper coated with glycerine, until required for use. Ammoniated chloroform is also used by Dr. Richardson as an inhalation to reduce pyrexia. It is prepared by mixing together equal parts of strong alcoholic solution of ammonia and chloroform, the small quantity of water that separates after a time being removed by means of bibulous paper. The compound is described as a clear, pleasant-smelling liquid, with much less pungency than ammonia. About two drachms are placed in the inhaler, and gradually breathed during half an hour. The inhalation may be repeated as often as required, and carried on until the narcotic action of the chloroform is clearly but not deeply manifested.

Another subject mentioned by Dr. Richardson (*Asclepiad*, p. 165) is the internal administration of amyl nitrite, which he speaks of as advantageous in some cases, especially in asthma. The most convenient formula he has found to be as follows:—

Amyl nitrite, pure, ...	♏xxxvj.
Ethylic alcohol (sp. gr. 0·830), .	℥vj.
Pure glycerine, to	℥jss.

Dose, 1 fluid drachm in a wineglassful of warm water, to be swallowed slowly and repeated every two or three hours if necessary.

A new variety of menthol is likely to be placed on the American market during the coming summer. A sample of the crystals, which have been presented to the Museum of the Society, have the same crystalline form as the Japanese menthol and are white and dry, but have an odour quite different, resembling that of the American oil of peppermint. Mr. A. M. Todd, of Nottawa, Michigan, claims to have discovered a process for obtaining this menthol in crystals from the oil of *Mentha piperita* in sufficient quantity to meet public requirements. A sample of the menthol is in the hands of Professor Flückiger for examination, who will doubtless publish any results that he may arrive at in due course. Mr. Todd considers, as the result of his experience during seventeen years in the distillation of oil of peppermint, that the tests for its purity are not accurately known, or, at all events, are not accurately given in the United States Pharmacopœia. He finds in the oil a resinous principle which hinders the crystallization of the menthol, and in order to obtain the menthol easily, the oil needs careful rectification. By forcing sprays of steam through it and by recondensation, its crystallizing tendency is considerably increased. The price of this menthol from the true peppermint is likely to be about 50*s.* per pound.

Herr Dieterich states that an emplastrum adhæsivum c. iodoformo has met with much acceptance in Germany, it being prepared of two strengths, one containing 20 and the other 30 per cent. of iodoform. This plaster, if applied directly to the previously cleansed surface in the case of slight burns and small wounds, is said to cause a very rapid healing. According to the same authority an addition of salicylic acid to ordinary "lip salve," and a previous treatment of the almond oil used with benzoin, increase the healing powers of the ointment.

Being convinced of the advantage of presenting phosphate of lime to the stomach in the gelatinous form, rather than in the pulverulent form to which it is usually brought for convenience of washing, M. Tanret sought for a plan by which the monocalcic phosphate should be treated with just a sufficiency of slaked lime to convert it into tricalcic phosphate (*Journ. Pharm. Chim.*, [5], ix., 389). This he effects by mixing with the solution of acid phosphate the molecular proportion of lime dissolved by the aid of sugar. He finds that practically to obtain a given quantity of gelatinous phosphate the proportions to be taken are the same quantity of acid phosphate and half as much slaked lime.

The German Pharmacopœia orders the removal of the oil from powdered ergot by means of ether. Messrs. Denzel and Wacker having examined the oil so removed (*Archiv*, xxii., 314) found it to contain ecbolin, one of the active constituents of ergot; they therefore think the official instructions defective. A similar result was obtained when carbon bisulphide was used. On the other hand, with benzine or light petroleum spirit a very pure oil was obtained, free from any trace of ecbolin. The superiority of light petroleum spirit for this purpose is also affirmed by Herr Dieterich, who further recommends the same solvent for removing the oil from the powders of henbane, sabadilla, staphisagria and mustard seeds, as well as from cochineal.

Bearing in mind the varying composition of many tannin compounds, and considering that the reasons that sometimes call for their use do not exist in the case of "cannabinum tannicum," Herr Bombelon was induced to prepare some pure cannabinum by treating the tannin compound with zinc oxide. He obtained it as a greenish-brown powder, not agglutinating upon exposure to the air, and volatilizing without residue from platinum foil. In doses of 0·05 to 0·10 gram it produced sleep without previous excitement, whilst cannabinum tannicum was found to act more unequally and require higher doses. "Pure cannabinum," prepared in this way, is described (*Pharm. Zeit.*, May 10) as tasteless, insoluble in water, and readily soluble in alcohol, ether and chloroform. As the best vehicle Herr Bombelon uses pulv. coffeæ tost., or pulv. cacao exoleat., and it is given as a powder, in pills or as an emulsion.

The use of corrosive sublimate as an antiseptic is rapidly increasing. Dr. P. Negri who has used it extensively in the Maternity Hospital, at Novare, states (*Practitioner*, p. 377) that the toxic effects of a solution of 1 part in 1500 or 2000 is almost *nil*; in one case only he observed slight mercurial exanthema. He considers that the weaker solution is sufficiently strong to prevent puerperal sepsis, and that it will completely replace that of the 2 per cent. solution of carbolic acid, over which it has the advantage of being cheaper and of having no odour.

Sulphate of copper is also being used with success as an antiseptic in obstetric practice (*Med. Times*, May, 24, p. 207). The solution is used of a strength of 1 per cent., and is warmed before use to 36 to 38° C. It possesses the advantage of having no odour, not causing discoloration like perchloride of iron, while possessing similar astringent and coagulating properties, and if employed several times in the twenty-four hours during eight or ten days it has no other effect than slowing the pulse and lowering the temperature.

In the *Lancet* (May 3, p. 795), Mr. S. Gamgee, consulting surgeon to the Queen's Hospital, Birmingham, describes a substitute for sponge which he has invented, and which combines absorbing power with elasticity, while it is cheap enough to be burnt after use. This he proposes to make permanently antiseptic by enclosing a thin ball in the centre con-

taining any desired antiseptic, which could be set free by cracking the capsule with a squeeze. The chief constituents of the artificial sponge are cocoa-nut fibre and absorbent cotton. These sponges are said to absorb sixteen to eighteen times their weight of fluid, and readily fill and squeeze out again like an ordinary sponge.

The value of crushed ice as a dressing for burns and scalds, first pointed out by Sir James Earle, is confirmed by Dr. Richardson (*Asclepiad*, 164). The ice after being reduced by crushing or scraping to a fine state of division, as dry as possible, is mixed with fresh lard into a paste, which is placed in a thin cambric bag and laid upon the burn. This is said to banish all pain until the mixture has so far melted that a fresh dressing is necessary.

Having accidentally received some splashes of brown fuming nitric acid upon the skin of the face, and reasoning that the action of the acid was one of intense oxidation, Mr. Irving tried the effect of a dilute solution of sulphurous acid that happened to be available, and he describes it (*Chem. News*, May 2) as astounding. The action of the nitric acid seemed to be immediately arrested, and the pain removed, whilst the wound healed afterwards very rapidly.

In a comparison of the notices hitherto occurring in literature of nonylic acids (pelargonic acids) of various origin there is a certain degree of correspondence observable, but not such to warrant any conclusions as to their identity. Herr Bergmann was, therefore, induced to prepare and compare samples of nonylic acid (1) from the normal octyl alcohol of heracleum oil, (2) by oxidation of oleic acid, (3) by oxidation of methyl-nonyl ketone, (4) from the distillate of the leaves of *Pelargonium roseum*, (5) from the fusel oil of beet molasses, and (6) from undecylenic acid. The results obtained, which the author describes in detail, as well as the methods of preparation (*Archiv*, xi., 331), leave scarcely any doubt that the six different products were all identical with one another.

In an interesting contribution to the "histo-chemistry" of plants (*Monatshefte*, v., 94) Herr Rosoll illustrates the light that can be thrown upon vegetable principles by studying them microchemically *in situ* in the plant. The first plant mentioned is the *Helichrysum bracteatum*, the yellow flower heads of which are well known as a variety of "everlasting flowers." This yellow colour is very persistent, but when the dried flower heads are dipped in borax solution to which hydrochloric acid has been added, the involucral leaflets become a beautiful ruby-red colour. Further investigation showed this yellow pigment to be a hitherto undescribed quinone-like substance, which Herr Rossoll has named "helichrysin." In the younger leaflets it exists in combination with protoplasm, whilst in the older leaflets it has its seat in the residual cell contents. Helichrysin is soluble in water, alcohol, ether and organic acids; insoluble in benzol, chloroform and carbon bisulphide; is coloured purple-red by mineral acids and alkalies; and is precipitated by metallic oxides and their salts as a red coloured extract. The same body appears to be present in *H. orientale*, *H. fœtidum* and *Statice Bonduelli*. Passing to the fungi, the organs of fructification of the *Peziza aurantia*, with their yellow disk and lighter outer side, were examined. It was found that the orange colour is due to a new yellow pigment, that has been named "pezizin," which is present in the form of extremely minute drops combined with an oil-like substance that occurs dissolved in the plasma of the paraphyses. The pigment, which occurs also in *P. convexula*, may be dissolved out by alchol or ether. Saponin was ascertained to occur in the living roots of *Saponaria officinalis* and *Gypsophila Struthium*, dissolved in the cell juice, from which it can be separated in small amorphous white particles by treatment of thin slices of the root with absolute alcohol or ether. In the dried roots and in quillaia bark it occurs as an amorphous white or grey substance. By treatment with concentrated sulphuric acid and exposure to air, which gives rise first to a yellow, then a bright red and afterwards a beautiful blue-violet colour, saponin can be detected in the contents of all the cells of the parenchyma of the middle bark, the medullary rays and wood parenchyma of the fresh and dried roots, as well as in the contents of all the parenchyma cells of the middle bark of *Quillaia saponaria*. But the most interesting of these observations from a pharmaceutical point of view was one establishing that strychnine occurs in the seeds of *Strychnos Nux-Vomica* and *S. potatorum* dissolved in oil droplets suspended in the contents of the endosperm cells.

As a microchemical test for solanine, Herr Schaarschmidt lays the section to be examined in moderately concentrated sulphuric or nitric acid and then brings it under the microscope, when in a few seconds the presence of the alkaloid is marked by a beautiful rose colour (*Chem. Zeit.*, May 11). In this way the author recognized the presence of solanine in *Solanum tuberosum*, where the principal seat of the alkaloid is in the stalk, and especially in the tuber; also in *S. nigrum*, *S. Dulcamara*, *Capsicum annuum*, *Lycopersicum esculentum* and *Mandragora officinalis*.

In attempting to introduce hydrogen into the coniine molecule ($C_8H_{17}N$) to form octylamine ($C_8H_{19}N$), by distillation of the dry hydrochlorate with zinc dust, Dr. A. W. Hofmann found that hydrogen was given off instead, and a new base formed, having the composition represented by the formula $C_8H_{11}N$, and standing in the same relation to coniine as pyridine to piperidine (*Ber. Berl. Akad.*, 1884, 161). This base, which has been named "conyrine," is a colourless liquid, showing a beautiful blue fluorescence, lighter than water, boiling at 168° to 170° C., and having an odour resembling pyridine and picoline, but less pungent. When oxidized by means of solution of permanganate, conyrine yielded pyridinmonocarbonic acid (*Berichte*, xvii., 825). This and other considerations pointed to the probability that conyrine was orthopropylpyridine, while coniine was orthopropylpiperidine, or orthopropylpyridine hexahydride. An attempt was therefore made to regenerate coniine from conyrine, which was completely successful, and it therefore only remains to convert pyridine into orthopropylpyridine (conyrine), which, probably, will not be difficult, to complete the synthesis of coniine.

Ordinary commercial sulphuric acid seldom contains more than 96 per cent. of sulphuric monohydrate (H_2SO_4), and only exceptionally 98 per cent., since the acid is decomposed by the heat required for evaporation at about this degree of concentration. But it is reported that at Griesheim, in Germany, it

has been found that the monohydrate can be obtained in crystals on the manufacturing scale by submitting the "acid" to a sufficient degree of cold (98 per cent. to a little below 0° C., and 96 and 97 per cent. to about −10° C.). The first crystallization still retains some mother-liquor, but the pure monohydrate is obtained by melting the crystals and repeating the operation. The reduction of temperature due to heat becoming latent in the liquefaction of the crystals is utilized to cool a further quantity of crystals.

Dr. Olszewski has determined the solidifying temperature of several of the gases that Faraday failed to solidify in consequence of not being able to produce a sufficiently low temperature (*Monatshefte*, v., 127). The refrigerating medium used by Dr. Olszewzki was liquid ethylene, in conjunction with an air pump, by which means he was able to reduce the temperature, if required, to −139° C. At −102° C., under ordinary pressure, chlorine formed an orange liquid, in which there was a separation of yellow crystals, and at a lower temperature the whole liquid formed a yellow crystalline mass. At the same temperature hydrochloric acid gas formed a colourless liquid, which solidified at −115·7° C. to a white crystalline mass that began to melt again at −112·5° C. Arseniuretted hydrogen also formed at −102° C. a colourless liquid and a white crystalline mass at −118·9° C., melting again at −113·5° C. Ethyic ether, freed from alcohol and water, solidified at 129° C. to a white crystalline mass, which passed again into a liquid at −117·4° C. Pure amylic alcohol formed at −102° C. an oily liquid, had the consistence of soft butter at −115° C., and froze at −134° C. to a hard semi-transparent body.

Dr. Phipson records the observation (*Chem. News*, May 2) that the odour of ether which appeared to be given off by lemons after having been kept for a time in a damp cupboard was coincident with the development of *Aspergillus glaucus* upon them. He thinks the odour is due to the breaking up of citric ether (triethylic citrate) under the influence of the fungus, and makes a suggestion as to what probably takes place. Under the influence of warmth and moisture some of the sugar in the ripe lemon undergoes fermentation, and the alcohol formed combines immediately with citric acid to form triethylic citrate, which is split up by the fungus into free ether, which is volatilized, carbonic acid, and, probably, other intermediate products. It may be remembered that in a communication to this Journal some years since ([3], v., 201), Mr. F. M. Rimmington attributed the development of an odour of acetic ether in some concentrated infusion of quassia to the formation of acetate of ethyl under the influence of cryptogamic life.

In a recent communication to the Asiatic Society of Japan (*Nature*, April 24), Mr. O. Korschelt gave some very interesting information respecting the constituents of Japanese lacquer. He considers the raw lacquer juice to be an emulsion which contains a peculiar acid (urushic acid), a gum, a nitrogenous body, water and traces of a volatile acid. The hardening of the juice that takes place when it is exposed in a thin layer to moist air at a temperature between 20° C. and 27° C. is due to the oxidation of urushic acid to oxyurushic acid under the influence of the nitrogenous body, which acts as a ferment. Whilst the gum is useful in maintaining the condition of an emulsion, its presence in the hardened lacquer is injurious, as it gives rise to blisters in contact with water. The reduction of the proportion of gum by the admixture of raw juice with separated urushic acid is, therefore, advantageous; but on the other hand, if this admixture be carried beyond five parts of acid with one part of juice the activity of the ferment is interfered with. The ferment is an albumenoid, but contains much less nitrogen than albumen, and it cannot be replaced by diastase or ptyalin. The quality of the lacquer seems to be dependent upon its richness in urushic acid and poverty in water, the durability of the finished work being due to the oxyurushic acid, which is singularly negative in its reactions, resisting all solvents tried, and being affected only by strong nitric acid. What is known as lacquer poisoning is stated to be due to urushic acid, which gradually disappears; the best antidote for it is sugar of lead.

Mr. J. M. Wood, the Curator of the Botanical Gardens, at Durban, Natal, writes that he has received plants of the true Socotrine aloe, *Aloe Perryi*, direct from Socotra, and that there is a probability that the cultivation of the plant for the sake of the juice will be commenced very shortly in Natal. The specimens sent from Kew to Jamaica appear to have died, according to Mr. D. Morris's report, and it is therefore interesting to learn that there is hope that Socotrine aloes of good quality may again become a commercial article in a few years. Mr. McAlpine, a botanist who has just started for Tasmania, has in view the cultivation of medicinal plants in that island and intends to include among them this aloe. He hopes in the course of a year or two to be able to supply the Antipodes with better samples of henbane, belladonna, etc., than they at present receive from this country.

Mr. T. Darwin, in an article in *Nature* (May 1, p. 7), on the "Absorption of Water by Plants," shows that the rate of absorption is influenced by the dampness or dryness of the air, being more rapid in dry air, owing to the more rapid evaporation from the leaves, and more rapid in sunlight than in shade. He also confirms Baranetzky's statement that a small disturbance, such as a slight shake, by increasing the transpiration from the leaves increases the rate of absorption, while cutting off a twig rapidly diminishes it. A. Sorauer, however, found in some experiments on gourds that the removal of leaves from plants on two occasions did not alter the amount of evaporation in the least; and even when half the leaves were removed from another plant, although a reduction in the amount of evaporation ensued at first, after eleven days the evaporation was equal to that of an untouched plant (*Journ. Chem. Soc.*, xlvi., 627).

The rapid changes of temperature and the dry winds during the last few weeks must have had an injurious effect on the hop gardens exposed to their influence, since according to A. Schwartz (*Journ. Chem. Soc.*, xlvi., 629), these conditions bring about an unhealthy state of the plant under which it readily falls a prey to mildew and aphides, which is not the case with plants sheltered by trees or hills or otherwise protected from the changes of weather, nor with those which being planted late are less liable to be subjected to changes of temperature.

A correspondent, writing from Parkstone, near Poole, Dorset, remarks that the vegetation in that neighbourhood is about three weeks behind owing to the continued east winds. The broom

is only now in full blossom, while the elder is just beginning to burst into bloom. In the gardens the bay tree, *Laurus nobilis*, is covered with flowers. The different species of pine, chiefly *Pinus sylvestris* and *P. maritima*, which render the air so fragrant and healthful for many a mile in the neighbourhood of Parkstone, are becoming lit up as it were by the bright green shoots, which contrast pleasantly with the dark tints of the last year's foliage. The abundance of the purple orchis in the meadows suggests that it would be no difficult matter to obtain salep in this country if it were so much valued as in the east.

A number of medicinal plants may be looked for this month. The pretty flowers of the buckbean, *Menyanthes trifoliata*, are in good condition for collection in bogs and marshy ground. The buckthorn may be seen covered with its small green blossoms in hedges in chalky or marly districts. The feathery plumes of the *Pulsatilla* make it recognizable in spots where the flowers might easily be overlooked. The black and white mustard are beginning to give a yellow tint to fields and railway hedge banks, and the red poppy has commenced to give a little brightness to the monotonous green of the cornfields.

At the drug sales during the past month the root of *Ionidium Ipecacuanha* has been offered for sale as the true drug, being classed in the list under the head of ipecacuanha, without any intimation that it differed from the rest of the packages. A quantity of spurious cubebs, which had been sent from this market to America and returned to London, has again been put in the market here and some of it purchased under the belief that it was genuine.

FURTHER NOTE ON WARAS.

BY W. T. THISELTON DYER, M.A., C.M.G., F.R.S.

By an odd coincidence no sooner was my note on this very curious substance printed in the pages of this Journal, by the obliging courtesy of the Editor, than I received a further most interesting communication on the subject from Major F. M. Hunter, Assistant Resident at Aden. It contained a memorandum giving the complete history of the collection of the drug with a further specimen in fruit of the plant producing it, the pods bearing the epidermal glands still undetached. There can be now no sort of doubt that the "waras" plant is really that described by Mr. J. G. Baker, F.R.S., in the 'Flora of Tropical Africa,' as *Flemingia rhodocarpa*.

But my colleague, Professor Oliver, F.R.S., whose kindness is only equalled by his sagacity, has made the curious discovery that a *Flemingia* apparently confined to South India, *F. Grahamiana*, W. and A., is not specifically distinguishable from *F. rhodocarpa*; the pods are in fact clothed with the same peculiar epidermal glands so characteristic of that species. The "waras" plant is therefore really to be found in India after all.

In creating a new species for the "waras" plant, Mr. J. G. Baker pardonably neglected the comparison of the material he was working upon with specimens of the species occurring in so remote and botanically widely severed an area as the southern part of the Indian peninsula.

I trust that room may be found for Major Hunter's memorandum, which I append in its entirety.

NOTES ON "WARS" COLLECTED AT HARRAR IN FEBRUARY AND MARCH, 1884.

"In the neighbourhood of the city 'wars' is not now raised from seed sown artificially, and it is left to nature to propagate the shrub in the surrounding terraced gardens. The plant springs up, among jowari, coffee, etc., in bushes scattered about at intervals of several yards more or less. When sown, as among the Gallas, it is planted before the rains in March. If the soil be fairly good a bush bears in about a year. After the berries [pods] have been plucked the shrub is cut down to within six inches of the ground. It springs up again after rain and bears a second time in about six months, and this process is repeated every second year until the tree dies. Rain destroys the berry [pod] for commercial purposes, it is therefore only gathered in the dry season ending about the middle of March. The bush grows to a maximum height of six feet and it branches close to the ground. The growth is open and the foliage sparse. Each owner has a few acres of land.

"In the middle of February, 1884, the following processes were observed:—

"The leaves [? fruiting shoots] of some plants were plucked and allowed to dry in the sun for three or four days. (The picking is not done carefully and a considerable quantity of the surrounding twigs, etc., is mixed with the berries [pods].) The collected mass was placed on a skin heaped up to about six or eight inches high and was tapped gently with a short stick about half an inch thick. After some time the pods were denuded of their outer covering of red powder which fell through the mass on to the skin. The upper portion of the heap was then cleared away and the residual reddish green powder was placed in a flat woven grass dish with a sloping rim of about an inch high. This receptacle was agitated gently and occasionally tapped with the fingers, the result being the subsidence of the red powder and the rising to the surface of the chaffy refuse, which latter was carefully worked aside to the edge of the dish and then removed by hand. This winnowing was continued until little remained but red powder. (No great pains are even taken to eliminate *all* foreign matter.) A rotl was sold in 1884 for about 13 piastres = 1 rupee 10 as. nearly.

"'Wars' is sent to Arabia, chiefly to Yemen and Hadhramaut, where it is used as a dye, a cosmetic and a specific against cold. In order to use it, a small portion of the powder is placed in one palm and moistened with water, the hands are then rubbed smartly together, producing a lather of a bright gamboge colour, which is applied as required."

SORGHUM SUGAR.*

BY OSCAR HOUCK, PH.G.

The different kinds of sorghum (*Sorghum saccharatum*) now under cultivation in the United States, are varieties and hybrids from two main groups; the one the Chinese sugar cane, or sorgho, or sorghe, from China and India, and the second the African sugar cane, or imphee, from the south of Africa. As varieties of the first group, we have the regular sorghum, Honduras cane, honey top, sprangle top, etc. Of the second group the most important are the Liberian imphees, white African, white mammoth, Iowa red top, and wolf's tail. As hybrids, the early amber is the most common, early orange and a

* From the *American Journal of Pharmacy*, May, 1884.

number of others. These hybrids need, as also their names indicate, a shorter time to attain maturity, and are, therefore, especially adapted for the more northern range, Wisconsin, Minnesota, etc., where the season is rather short; while the countries further south, with a longer season, have the advantage that they can utilize both the early and late varieties, and thus be able to supply the mills for a longer time; besides that they also can utilize the other qualities, desirable in good cane, as saccharine richness, large percentage of juice, and large stalks. A rather sandy loam is said to be the most favourable soil for its cultivation.

The first seeds of the new sugar cane were brought to America in 1854, from France, where they had been imported from China only a few years previous. Not long afterwards also seeds of the African variety found their way over here. And now sorghum is to be found cultivated almost in all parts of the United States, where the climate is favourable to its growth; and it is said that where maize will thrive sorghum also will.

Its principal use has, until lately, been confined to the mere production of syrup, as a very sweet, and, to most persons, agreeable article of this kind may be prepared by means of quite inexpensive machinery. But the production of a cheap, marketable sugar from it has, until the last three years, met with no success. Sugar has, of course, been produced from it long before this, but on account of inferior machinery and limited means it would not pay. It is also said that a fatty substance is contained in the juice of sorghum, which hindered the crystallization of the sugar, and necessitated another process than that used for the common sugar cane. The first sugar reported obtained from sorghum was made by a farmer in Wisconsin (according to Professor Carl Mohr). In 1858 J. S. Levering, a chemist of Philadelphia, received the gold medal from the United States Agricultural Society, as an acknowledgment for his successful and meritorious experiments in sugar making from sorghum (*Amer. Journ. Pharm.*, 1855, p. 182; 1858, p. 105). In spite of the publication of his process no attempt was made to utilize it. Later, through the Commissioner of the Department of Agriculture at Washington, G. W. Le Duc, a great deal was done in order to arouse the interest for it, that new experiments should be undertaken. Steward, a Pennsylvania chemist, also treated the subject, and showed at the Centennial Exhibition, in 1876, samples of sugar which he had obtained by his experiments. With still greater energy Dr. Collier, chemist of the Agricultural Department at Washington, took up the work, and of the results of his thorough investigations he has given a minute account in his several reports, which has thrown much light on the subject.

At the same time Professor Swenson, of the University of Wisconsin, was occupied with investigations of the same kind, and when the United States Government, through the Agricultural Department at Washington, offered a prize of 1200 dollars for the best method of treating sorghum cane it was awarded to him.

Some New York capitalists, after having corresponded with Professor Swenson and secured his service, determined to establish a sugar mill in some portion of the country, where the cane could be grown successfully and cheaply. The Arkansas river valley was decided upon, and in 1882 the mill was built at Hutchinson, Kansas. As an experiment some sugar was successfully made, already late, the same season. Last fall (1883) they made as an average forty barrels of sugar and about two hundred gallons of syrup a day. This was the first undertaking on a large scale, and, as it proved a success, others have followed their example, and many more are likely to follow.

The process used in the above-named mill I have not seen myself, but will give it as it has been described. The cane, having been examined by the chemist and found in the desirable ripe condition (when it contains most saccharose and least glucose), is cut, topped, and hauled to the mill without stripping. Arrived there it is placed on a long endless belt, which acts as an elevator to carry it to the crusher, which consists of huge iron rollers. The cane is passed through this crusher at the rate of twenty-five tons per hour. The juice, as it runs from the rollers, passes into a large tank, from which it is pumped into the defecating room. Here it is run into six defecating pans, capable of holding three tons of juice each. In these are coils of copper tubing, through which steam is passed to heat the juice. To the lukewarm juice is then added milk of lime, until slightly alkaline, in order to neutralize the acids, which are always contained in it, and to coagulate the albuminous matter present. It is then heated as rapidly as possible to the boiling point, and the steam is shut off when the thick scum, which rises to the surface, begins to swell and break. After a few minutes the juice is skimmed, and it is again heated, this time to a quiet ebullition, and again skimmed. This is repeated a few times, and the result is a very clear juice, almost free from sediment. From the defecating room the juice, containing 84 parts of water and 16 parts of sugar, passes to the evaporating pans, where it is boiled down to 54 parts of water and 46 parts of sugar, when it is called "semi-syrup." This passes into a small vacuum pan, and from there into the bone-black filters. These are six in number, and are each cylindrical in shape, 4 feet in diameter and 20 feet high. Here the syrup is decolorized and deodorized, after which it is pumped into the large vacuum pan. This is ovoid in shape, made of boiler iron, and looks like a huge retort. It is 7 feet in diameter, 9 feet high, and will hold more than 1000 gallons. In this the semi-syrup boils at 70° C. under diminished pressure, instead of 110° C. in free air. This is a great advantage, as it is a well-established fact that high heat and much exposure to the air quickens the conversion of saccharose into invert sugar. From the vacuum pan the syrup is put into large iron waggons, which hold about 240 gallons each, and in them is run into the crystallizing room. This room is kept at a temperature of 55° C., and in it the syrup is allowed to stand for several days until it crystallizes. The "melado," as the syrup at this stage is called, is then run into the mixer. This is a long bar with fingers attached, the whole revolving in an iron box. In this the melado is thoroughly mixed and made ready for the last process. From the mixer the melado is run into the centrifugals. These, four in number, are tubular vessels about three feet in length and two feet high, open above and closed below. Each is lined with fine copper sieve, a space of perhaps two or three inches intervening between the sieve and the outer wall of the centrifugal. The centrifugals are set in motion at the rate of 2000 revolutions per minute, and the melado is run into them, falling upon a revolving disk in the centre. From this the melado is thrown with great force against the side of the vessel, striking upon the copper sieve, which is also in rapid revolution. The force of the projection throws the syrup through the sieve, while the crystallized sugar remains behind, whitening the longer it "spins," as the process is called. It is generally allowed to spin about fifteen minutes, after which the raw sugar is taken out and put into barrels, and the process is completed. Each centrifugal is capable of spinning 200 lbs. of sugar in those fifteen minutes. Besides these details, the process has, of course, its secrets, which are also kept as such.

From the above-named factory I obtained a sample of sugar, of which I made an analysis, which shortly will be explained. In appearance the sugar looks very much like the common raw sugar of commerce. But in odour and taste it differs somewhat, as it has retained some of that peculiar sorghum flavour, which is not disagreeable, and in which place in common raw sugar is found a taste and smell of burnt sugar.

In my analysis of the sorghum sugar I found the following constituents:—

Saccharose	92·00 per cent.
Glucose	4·50 per cent.
Moisture	1·50 per cent.
Ash	1·10 per cent.
Impurities	0·90 per cent.
	100·00

The amount of saccharose was ascertained by the use of the Wilde polariscope, which as an average showed 92°. With the same instrument I examined samples of different sugars with the following results (the strength of the solutions was 10 grams of sugar and water sufficient to make 100 c.c.):—

White rock candy polarized	100°
Yellow rock candy polarized	93°
Best granulated sugar polarized	99°
White A sugar polarized	94°
Common raw sugar polarized	84°
Sorghum sugar (4 experiments)	90°, 92°, 93°, 92°

Common raw sugar was also subjected to analysis for comparison:—

Saccharose	84·00 per cent.
Glucose	11·80 per cent.
Moisture	2·50 per cent.
Ash	0·70 per cent.
Impurities	1·00 per cent.
	100·00

The moisture and ash of granulated sugar were also ascertained and found to be respectively 0·55 and 0·44 per cent. This shows in reference to the moisture, that the more glucose contained in the sugar, the more moisture is absorbed. As to the sorghum sugar the comparison is very satisfactory, as it contains 8 per cent. more saccharose than the common raw sugar, and only 2 per cent. less than the A sugar, which has gone through a refining process. This very satisfactory result is due to the improved machinery, of which the vacuum pan and the centrifugals are the most important, and without which the idea of sugar making, from sorghum, at the present sugar prices, might be given up as almost hopeless. But as it is, sorghum sugar can compete with other sugars, both in price and quality.

CRITICISMS, FROM A CHEMICAL POINT OF VIEW, ON SOME FAVOURITE PRESCRIPTIONS.*

BY HENRY LEFFMANN, M.D.

The few points that I present to the College this evening will include little that is absolutely new, but I think the time will not be entirely wasted, as I know that the prescription list of most of our drug stores will give numerous examples of the violation of chemical principles here mentioned. My attention was called to this topic by my being shown by an apothecary a prescription calling for syr. hypophosph., tinc. ferri chlor., acid. phos. dil., concerning which he said that in the proportions ordered he could never make the mixture up clear. I examined the precipitate, and found in it, as I had expected, a large proportion of the iron and other basic ingredients This is a simple case of incompatibility. Turning the matter over in my mind, it has seemed to me that while some attention is paid to cautioning students as to the general nature of incompatibility, very little or none is given, especially in the shallow chemical teaching of many medical schools, to the properties and qualities of chemical substances in their relations to the animal tissues and the manner of administration. I present here, therefore, a brief consideration of a few well-known remedies.

Under the name of *colourless tincture of iodine* several preparations are used, depending for their popularity on the fact that they do not stain the skin. They are prepared either by the use of ammonia or of sodium sulphite or hyposulphite. They owe their particular property, or rather absence of property, to the neutralization of the iodine, and just to the extent that the iodine is decolorized is it to the same extent deprived of virtue. The free active affinity of the iodine, to which its local action must be due, is destroyed in these preparations, and the destruction is not slow or uncertain, but in two of the methods mentioned it is sufficiently rapid and definite to be made the basis of a method of quantitative analysis. It is certainly difficult to see how any person could go so wide of simple chemical principles as to invent or employ this mixture.

Potassium chlorate, or, as it is still erroneously called by many, chlorate of potash, is a remedy concerning which extraordinary claims have been made, based upon most erroneous notions of its chemical qualities. It is employed in the laboratory as a source of oxygen. Knowledge of this fact has led to its employment as an oxidizing agent in diseases which have been supposed to express deficient oxidation. I have nothing to say here as to the clinical results obtained from potassium chlorate in any disease,—although I believe it is much less in favour than formerly,—but I enter a protest against any advocacy of its usefulness as an oxidizing agent. Under temperatures and conditions such as those which it meets in the human system it is one of the most stable of bodies, does not part with its oxygen or chlorine, and, indeed, will not begin to do so except under very high heat. I have found by actual experiment that ten grains of the salt kept for two hours at a temperature of 100° F. in contact with an artificial gastric juice did not develop oxidizing qualities sufficient to oxidize one-sixtieth of a grain of phosphorus. This experiment is merely confirmatory of what everyday experience with the substance teaches.

Potassium permanganate has been more or less in favour with physicians for a score of years. It is well known as an oxidizing agent; its powers in this respect are well marked. It is as little suitable for internal administration for such purpose as the body just considered, but for an opposite reason. Its chemical properties are developed by almost every substance, and in the doses in which it is given it will be decomposed and rendered inert very shortly after being swallowed. Within a very recent period the salt has come into notice as a remedy for amenorrhœa, and great has been the tribulation of apothecaries. It has been given in pill form, and all the usual excipients have been unavailable. I have made a few tests of the permanganate pills now in the market, and I find with regard to those made by one of the most reliable houses in this city that the permanganate is all decomposed and converted into the insoluble manganese dioxide. The preparations of two other manufacturers made up with some mineral excipient, probably kaolin, were in good condition, but as soon as placed in a mixture of hydrochloric acid and pepsine they begin to decompose into insoluble manganese oxide. These pills vary in strength from one-eighth to one grain. This small quantity of permanganate certainly must soon decompose in the stomach, and the only virtue which it can have is from the manganese itself, and if this is effective common sense would seem to suggest that the result could be best obtained by exhibiting some definite compound of manganese, such as the chloride or sulphate. When we consider the chemical relations of the salt, and almost certain inertness of it in small doses, the gravity with which the learned English therapeutists, who recommend it in amenorrhœa, have discussed the possibility of its producing abortion, becomes almost burlesque. I do not

* Read before the College of Physicians of Philadelphia, April 2, 1884. Reprinted from the *Boston Medical and Surgical Journal*.

desire, of course, to impugn the clinical observations that have been recorded on this point, but I feel obliged to say that if the insoluble and variable decomposition products of one-eighth of a grain of potassium permanganate can affect the function of any one organ, then the difference between us and the apostles of the infinitesimal is small indeed.

I cannot dismiss these two compounds, which owe their popularity to mistaken notions of their properties, without saying a word or two as to the exhibition of oxidizing agents. If rational therapeutics or physiological study indicates remedies of the so-called oxidizing class, then it will be found that no better agents are known to us than those which have long been in our hands. In nitric acid, nitro-muriatic acid and chlorinated soda we have substances which are sufficiently stable to resist the organic bodies of the saliva and gastric juice, and are sufficiently active to give oxidizing effects if such (other than local action) can be obtained. I have grave doubts whether the nutritious fluids of the body can be oxidized by any method, but there can be no doubt whatever that such effect cannot be attained by either a body—potassium chlorate—which yields its oxygen only at a red heat, nor by one—permanganate—that decomposes the moment it touches any form of organic matter. Some years since a correspondent in one of our medical journals gravely recommended the use of raspberry syrup to disguise the taste of potassium permanganate. It was, of course, entirely successful, the taste was destroyed, so was the compound.

Caffeine citrate is a remedy much in favour and is a remarkable instance of how much physicians take for granted in the remedies they use. There is no caffeine citrate in the market, and it is doubtful whether any such a salt can be prepared. The commercial preparations are either pure caffeine or variable mixtures of it with citric acid.

The manufacturers in this city each furnish a different article, except in cases in which they buy from a common source; and a house in a neighbouring city furnishes an article which contains no citric acid. Some of the samples are purely bitter in taste while others are distinctly sour. Analyses of some of the commercial salts are recorded in a paper read before the last meeting of the American Pharmaceutical Association, by Dr. G. C. Wheeler. He found the quantities of caffeine varied from 96·5 per cent. to 63·5 per cent.; of citric acid from 63·5 per cent. to 3·5 per cent.; none of these figures correspond with the proportion of a true citrate.

It seems to me that accurate clinical observation cannot be made with a preparation of so uncertain a character; for, as seen by these figures, the proportion of active ingredient may vary 33 per cent., and the lesson that these analyses teach us is that when the effects of caffeine are wanted they are best obtained by the use of the pure alkaloid and not by a pretended and uncertain compound of it.

PSEUDOMORPHINE.*

BY O. HESSE.

In his first communication on this alkaloid, which he obtained from opium, the author stated his belief that it was identical with the oxymorphine of Schützenberger, and that its formula was $C_{17}H_{19}NO_4$. Brockmann and Polstorff (Abstr., 1880, 408) contended that this oxymorphine had the constitution $(C_{17}H_{18}NO_3)_2$, and based their assumption principally on the fact that nitric oxide was evolved in its production from a solution of morphine hydrochloride and silver nitrite, whereas the formula $C_{17}H_{19}NO_4$ would require an evolution of nitrous oxide. The author now shows that if an aqueous solution of morphine hydrochloride is mixed in molecular proportions with a solution of potassium nitrite, and the whole heated for some time at 60°, crystals of oxymorphine are formed and a gas evolved which does not turn red in contact with the air, and is consequently not nitric oxide. The formation is evidently due to the decomposition of morphine nitrite,

$$2C_{17}H_{19}NO_3,HNO_2 = 2C_{17}H_{19}NO_4 + N_2O + H_2O,$$

and the author points out that an evolution of nitric oxide, when silver nitrite is used, might also be explained by the equation—

$$4C_{17}H_{19}NO_3,HNO_3 = 4C_{17}H_{19}NO_4 + N_2 + N_2O_2 + 2H_2O.$$

The author now finds that the body $C_{17}H_{19}NO_4$ is a hydrate of the real base, and that the formula for oxymorphine is, therefore, $C_{17}H_{17}NO_3$. The hydrate loses its water at 130°, but the base is so very hygroscopic that it is only by taking special precautions that rehydration can be prevented. The less crystalline the specimen in question, the more marked is its hygroscopic character. The alkaloid is best purified by solution in ammonia, from which it crystallizes in colourless crusts containing $1\frac{1}{2}H_2O$, which it loses at 130°. The *hydrochloride*, $C_{17}H_{17}NO_3,HCl$, crystallizes in scales containing, under varying conditions, respectively 1, 2, 3 and 4 mols. H_2O. A *basic hydrochloride*, $(C_{17}H_{17}NO_3)_2,HCl + 6H_2O$, is obtained in microscopic crystals from a hot neutral acetic solution on the addition of sodium chloride: from a cold solution, the basic salt crystallizes with $8H_2O$. With platinum chloride both the neutral and basic salts yield a yellow flocculent platinochloride

$$(C_{17}H_{17}NO_3)_2,H_2PtCl_6.$$

The *hydriodide*, $C_{17}H_{17}NO_3,HI + H_2O$, loses its water when exposed to the air: the *chromate*,

$$(C_{17}H_{17}NO_3)_2,H_2Cr_2O_7 + 6H_2O,$$

loses $4H_2O$ at 80°: the sulphate crystallizes with $6H_2O$, and effloresces slightly in dry air, but when crystallized from boiling water it is stable: the *oxalate* yields shining scales, with $8H_2O$: the *acid tartrate*,

$$C_{17}H_{17}NO_3,C_4H_6O_6 + 6H_2O,$$

crystallizes in needles or prisms. Heated for two hours at 120° with acetic anhydride, pseudomorphine yields *diacetylpseudomorphine*, $C_{17}H_{15}(C_2H_3O_2)_2NO_3$. It crystallizes from ether in concentrically grouped flat prisms, containing $4H_2O$, which it loses in the desiccator. It is moderately soluble in ether and chloroform, very soluble in alcohol, in which it yields a strongly alkaline solution. It contracts at 250°, but does not melt until 276°. It gives no coloration with ferric chloride. With hydrochloric acid it forms a salt crystallizing in quadratic tables, easily soluble in water. With platinum chloride this salt yields a pale yellow flocculent *platinochloride*,

$$[C_{17}H_{15}(C_2H_3O)_2NO_3]_2,H_2PtCl_6 + 6H_2O.$$

The di-acetyl compound is easily reconverted into the original base by heating it with alcoholic potash. It is clear, therefore, that the hydroxyl-groups of morphine are still present in pseudomorphine. The author was unable to obtain a methyl compound by the action of potassium hydroxide and methyl iodide. He, however, obtained pseudomorphine methyl-hydroxide,

$$C_{17}H_{17}NO_3,MeOH.$$

The author also believes pseudomorphine to be identical with the substance which E. L. Meyer (*Ber.*, iv., 121) obtained by the action of moderately concentrated sulphuric acid on a nitro-compound which he had obtained by passing a strong current of nitrous anhydride into water in which morphine was suspended.

* From *Annalen*, ccxxii., 234–248. Reprinted from the *Journal of the Chemical Society*.

THE COMPOSITION OF OIL OF GAULTHERIA.*

BY HARLAN P. PETTIGREW, PH.G.

The author gives a brief account of the investigations made by Professor Procter on the oil of sweet birch (*Amer. Jour. Phar.*, xv., p. 241), and of the information

* From the *American Journal of Pharmacy*, May, 1884.

furnished by G. W. Kennedy (*Ibid.*, 1882, p. 49), regarding its manufacture on a large scale and its sale in place of oil of gaultheria; and he refers to his chemical investigation of this oil (*Ibid.*, 1883, p. 385), which showed it to be methyl salicylate. The first experiments on the chemical composition were made by Procter (*Ibid.*, xiv., 211); afterwards a fuller chemical investigation was made by Cahours (*Ibid.*, xv., 241, from *Jour. de Phar. et de Chim.*, May, 1843). To the latter is generally attributed the statement that this oil contains 10 per cent. of terpene; but in the French journal named no mention is made of a terpene, and the presence even of methyl alcohol was not conclusively proved, as the following abstract from that paper shows:—"On treating this oil with a solution of potassa of 45° B., to which fragments of that alkali were added, and submitting the mixture to a regulated heat and distilling, a distillate was obtained in the receiver which, after being treated several times with lime, furnished a liquid more volatile than water, and burning with a pale blue flame." The original papers on "Salicylic Compounds," published by Cahours in *Annales de Chimie et de Physique* and in *Comptes Rendus*, could not be consulted.

Two different specimens of oil of gaultheria were examined by the writer; one was obtained by Professor Maisch, from Messrs. Underhill, Concord, N. H., and was distilled by them: the other was obtained directly from a distiller in Ellenville, N. Y., and both were guaranteed to be absolutely pure. These oils, when received, had already acquired a very slight reddish tinge, but upon redistillation were obtained as bright, colourless and quite highly refractive liquids, having the sp. gr. 1·17, both corresponding in this respect with the sp. gr. of oil of wintergreen as determined by Procter.

The oils were treated separately, 190 grams being operated upon in each case. The plan followed in the investigation of this oil was the same as that adopted in the analysis of the oil of birch (*Amer. Jour. Phar.*, 1883, p. 385), namely, saponification by treatment with a concentrated solution of potassium hydrate and boiling over a sand-bath in a flask fitted with an inverted condenser. After complete decomposition of the oil, the contents of the flask were submitted to distillation upon a sand-bath until the residue remaining in the flask was nearly dry. The distillate thus obtained presented a milky appearance, and globules of a yellowish oily substance were seen floating upon the surface. This is one striking difference between this oil and the oil of birch, as the corresponding distillate obtained from the latter was perfectly clear and transparent. The distillate was then agitated in the flask in which it was collected, with several successive portions of ether, and the ethereal solutions were carefully separated from the aqueous liquid, and the ether recovered by distillation upon a water-bath. The residue remaining in the flask then consisted (besides a few drops of water) of a yellowish oily substance, which was lighter than water and possessed a very strong peculiar odour entirely different from that of the oil of birch or wintergreen. The terpene was then weighed without any attempt being made to purify it, as the amount was small. This determination was only approximate, yet the amount of terpene found amounted to but 0·3 per cent. of the weight of the oil.

The aqueous liquid which remained after extracting the terpene by agitation with ether, and which contained the methyl alcohol, was perfectly clear and transparent, and the alcohol, which was obtained by repeated distillation of the liquid from a water-bath, collecting only the lighter portions which passed over first, and further rectifying these by distilling from caustic lime, possessed the same odour, and was of the same sp. gr. and boiling point as methyl alcohol.

The salicylic acid was obtained by making an aqueous solution of the salicylate of potassium, which remained in the flask after the first distillation, and decomposing this by the addition of a slight excess of hydrochloric acid, the chloride of potassium formed remaining in solution, while the salicylic acid formed as a dense white precipitate which, after washing with water and drying, was obtained pure by crystallizing from hot petroleum benzin.

Both specimens of oil examined yielded about the same amount of terpene, but as a portion of one of them was accidently lost, no attempt was made to weigh the small amount remaining.

These results show that oil of gaultheria, sp. gr. 1·17, does not contain 10 per cent. of a terpene; for, if it did, the specific gravity of the oil would necessarily be very much lower than that of the oil of birch, in which the absence of a terpene has been conclusively proved.

Whether the oil of gaultheria which has been distilled in the spring or summer contains more of the terpene than that distilled in the fall, is not known; but from results obtained by experiments made upon a specimen which was distilled in the spring, it seems that there is a difference, as this oil was found to have a sp. gr. of but 1·0318, and the absence of alcohol was shown upon application of several of the tests for that substance.

After referring to Mr. Kennedy's paper read before the American Pharmaceutical Association (see *Amer. Jour. Phar.*, 1883, p. 533; also 1883, p. 85), the writer continues:—According to information upon this subject obtained from a distiller of oil of gaultheria, the oil, which is seen floating in small globules upon the water, will, if allowed to stand twenty-four hours, all collect together into large drops, and settle to the bottom of the containing vessel. This alone shows that this oil cannot consist of a hydrocarbon, but to decide the question conclusively, a small amount of water, which was taken from the receiver just as it came over from the still, was agitated with several successive portions of ether, the ethereal solutions, being carefully separated from the water, were evaporated, whereby only a very small amount of oil was obtained, which did not possess any odour of the terpene, and which consisted only of the pure oil of gaultheria. This shows that the terpene does not become separated in the process of distillation.

The results of these investigations may be briefly summarized as follows:—

I. Oil of birch is not identical with oil of gaultheria, in that it consists entirely of salicylate of methyl, and contains no terpene.

II. Oil of gaultheria, sp. gr. 1·17, does not contain 10 per cent., but only a very small amount, of terpene, to the presence of which is due the slight difference in odour and specific gravity between the two oils.

THE ALKALOIDS OF COPTIS TRIFOLIA.*

BY JOHN J. SCHULTZ.

To find the proportion of alkaloids in *Coptis trifolia*, 5 pounds of carefully selected coptis, in moderately coarse powder, were moistened with officinal alcohol and packed firmly in a properly prepared cylindrical percolator. Officinal alcohol was then added in successive portions of 2 gallons each. The last portion was acidulated with 4 ounces of acetic acid. After each addition, maceration was conducted for twenty-four hours, and percolation was continued until the percolate finally passed almost colourless and devoid of any bitter taste.

Five gallons and 5 pints of percolate of a yellowish brown colour and decidedly bitter taste were obtained. The dregs after having been removed from the percolator and dried at a temperature of 110° F., weigh 4 pounds and 8 ounces, showing a loss of 8 ounces.

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* From the *American Journal of Pharmacy*, May, 1884. These experiments were carried on in the laboratory of Professor J. U. Lloyd, upon authentic specimens furnished by him. We take this opportunity to thank him for the the attention shown us.

To 4½ pints of this percolate, representing 8 ounces of drug, an excess of sulphuric acid was added and the mixture set aside in a cool place.

To 1 pint and 2 ounces of percolate, representing 2 ounces of drug, an excess of hydrochloric acid was added and the mixture set aside with the foregoing.

After standing forty-eight hours a precipitate had formed in each, that of the sulphuric acid being light yellow, while that of the hydrochloric acid was yellowish brown.

The supernatant liquids in each case were bitter and retained a decided yellow colour, characteristic of berberine, showing that the precipitation of the berberine had been incomplete.

Two pints and 4 ounces of the original percolate, representing 4 ounces of drug, were then subjected to distillation, until the residue was of a syrupy consistence. The retort was then rinsed with 8 ounces of water, the result placed in an evaporating dish, and the last traces of alcohol vaporized. A dark greenish fixed oil and a lighter coloured resin began to separate as the alcohol evaporated, and these were completely precipitated by allowing the liquid to stand in a cool place for twenty-four hours. The contents of the dish were then thoroughly agitated with water and filtered. The filtrate was now evaporated to a syrupy consistence and 8 ounces of alcohol added. This was divided into two equal portions, and one was strongly acidulated with sulphuric, the other with hydrochloric acid, and both set aside in a cool place.

After standing twenty-four hours, the portion acidulated with sulphuric acid had formed a considerable amount of a brownish-yellow precipitate, but the supernatant liquid was still bitter and retained its yellow colour. The portion acidulated with hydrochloric acid showed only a slight cloudiness, and did not precipitate even after standing for two weeks.

The foregoing processes are the ones usually employed for the separation of berberine, and neither, in these instances, gave a satisfactory result.

Through the courtesy of Professor J. U. Lloyd, we were enabled next to employ his scheme for the determination of berberine, as stated in the manuscript of his work upon 'Drugs and Medicines of North America,' and which is based upon the insolubility of picrate of berberine in most menstruums.

The first step was to separate the second alkaloid, discovered by Mr. E. Z. Gross, as follows:—Of the remainder of the percolate, 4 gallons and 1 pint, representing 4 pounds of drug, were subjected to distillation, and the oil and resin separated in the manner heretofore described. To the resulting filtrate, officinal water of ammonia was added until slightly in excess. This produced a dark brown flocculent precipitate, which was collected on a filter and thoroughly washed with water. The filtrate, after having been slightly acidulated with sulphuric acid, and allowed to stand for several hours, was brought to an alkaline reaction by the addition of water of ammonia, when a second precipitation took place similar in appearance to the first. This and the foregoing precipitate after having been mixed and dried spontaneously, were treated with successive portions of chloroform. The chloroform was then distilled, and the residue exhausted with dilute sulphuric acid. The resulting solution when filtered and made alkaline by addition of ammonia water, gave a precipitate which, when dried spontaneously, weighed 3·42 grains.

A portion of this precipitate when dissolved in water acidulated with acetic acid, gave precipitates with the following reagents for alkaloids:—Platinic chloride, molybdate of ammonium, solution of iodine in iodide of potassium, and test solution of iodide of mercury and potassium.

A chloroformic solution of the remainder of this precipitate when evaporated on a slide formed microscopic crystals, but the quantity obtained was too small to admit of further investigation. (This was the second alkaloid as found by Mr. Gross.)

To a portion of the filtrate, from the foregoing precipitates, solution of carbonate of sodium was added without producing any precipitate, and it was positively shown that there was no more of this second alkaloid present.

To the entire filtrate and washings thus obtained from the second alkaloid, and which were of alkaline reaction, a solution of carbazotate of ammonium was now added. This produced a bulky yellow precipitate of carbazotate of berberine, which, when collected on a filter and dried spontaneously, weighed 292·8 grains, corresponding to 228·03 grains of sulphate of berberine.

In order to test the filtrate for any remaining alkaloids, a portion was evaporated nearly to dryness on a water-bath, and agitated successively with ether, chloroform, benzol and carbon disulphide.

The several solutions were evaporated, the residue dissolved in water and portions of it separately tested with test solution of iodide of mercury and potassium, molybdate of ammonium, and chloride of platinum, without producing any precipitate, thus showing the previous complete separation of all the alkaloids.

Recapitulation.—The foregoing experiments show, that *Coptis trifolia* yields to U.S.P. officinal alcohol, slightly acidulated with acetic acid, 10 per cent. of its weight of extractive matter. That it contains two alkaloids, as previously shown by the investigations of Mr. E. Z. Gross (*Am. Journ. Pharm.*, 1873). That the berberine of *Coptis trifolia* is only partially separated by the processes usually employed for the determination of berberine. That it contains of berberine an amount equivalent to 0·8 per cent. of sulphate of berberine, or 57 grains of sulphate of berberine to the avoirdupois pound. That the amount of the second alkaloid is very small, 0·012 per cent., or only 0·855 grain to the avoirdupois pound having been obtained.

PINKOS TUBERS.

Under the name "Pinkos-knollen," a very hard red woody substance has lately been introduced into the Vienna market, probably from Australia, which is found to be almost as valuable for turning purposes as ivory. Dr. Franz von Höhnel has subjected this substance to careful examination, and has determined, from the following characters, that it is the product of a coniferous tree belonging to the family Araucarieæ:—1. The absence of true vessels. 2. The absence of resin passages. 3. The extremely thin-walled medullary rays, consisting of a single row of cells, comparatively large, and placed in bulgings of the tracheids. 4. The remarkable pits which indicate the tracheids on the borders of the medullary rays. 5. The large bordered pits of the tracheids, which meet from opposite sides, usually placed in two rows, and then nearly polygonal. 6. The sclerenchymatous pith, from 4 to 5 millimetres wide. The so-called "tubers" are turnip-shaped, 15–40 centimetres long and 7–16 broad: broad and apparently broken off at one end, running out into a point at the other end. The transverse section shows a sclerenchymatous pith, 4–5 millimetres wide, surrounded by a number of very narrow annual rings, the older of which are concentric, the outer ones strongly excentric. They are usually covered by rotten wood and soil, and are probably gigantic knots which have fallen out of decaying and mouldering trunks in the primeval forest. Of the genera of Araucarieæ they must be derived from either *Araucaria* or *Dammara*, and very probably from *Araucaria Bidwillii*, the "bunya-bunya pine," a native of New South Wales.

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THE REGISTRAR-GENERAL'S RETURNS AS TO DEATHS BY POISONING.

WHITSUNTIDE is at hand, and Parliament has adjourned over the last ordinary recess in the session; but up to the present time the Government has given no sign with respect to the Poisons Bill which it has promised to introduce into the House of Lords. The introduction cannot, however, be much longer delayed, if the promise is to be fulfilled at all, so that the issue of another annual return of the Registrar-General, including among other things the statistics as to the deaths by poison that occurred in England in the year 1882, is opportune as furnishing information that will no doubt be quoted should the question reach the stage of legislative discussion this year. It is to be regretted, however, that the information which these statistics convey is not more precise, since they are lacking in just those details which would be most valuable at the present time. But probably the form in which a large proportion of the returns as to deaths by poisoning are at present received by the Registrar-General would render futile any attempt at making the classification much more definite.

The total number of deaths returned as due to poisoning during the year 1882 was 599, or 30 in excess of the previous year. Of these 246 deaths of males and 120 of females are referred to the division "accident and negligence," 117 males and 111 females to "suicides," and 5 to "murders." As the deaths from all causes in England in 1882 numbered 516,654, those that were attributed to poison therefore amounted to 1 in 863 of the whole. But it requires very little consideration to see that a very large number of these "poisoning" cases were such as would not be affected by any provisions likely to be included in a Poisons Bill. In the first place in 228 of them poisons were used by persons intent upon destroying their own lives, a class out of whose reach it is almost as hopeless to attempt to keep poisons as it would be razors, ropes, and rivers. Then out of the 366 deaths by poisoning referred to "accident and negligence" it is probable that not a few would be more fitly dealt with in a Noxious Trades Bill, as, for instance, the majority of the 78 deaths that are attributed to lead poisoning. It is of graver import in connection with the expected legislation that of the residue of the 366 deaths, after making deductions on account of sanitary shortcomings, no less than 115 are referred to mishaps with substances that are more or less narcotic. It will also be of interest to note respecting the substances which in the Draft Pharmacy Bill it is proposed to include in the schedule of "poisonous articles," that in this same class of deaths through "accident and negligence," 8 are referred to sulphuric acid, 4 to nitric acid, 7 to hydrochloric acid, and 15 to carbolic acid. It would be hardly worth while, however, to go through the details *seriatim*; but it may help to the formation of a judgment of the relative importance of the Registrar-General's statistics if we bring the principal facts together in a tabular form.

NAME OF POISON.	Total No. of Deaths.	ACCIDENT, ETC.		SUICIDES.	
		Male.	Female.	Male.	Female.
Arsenic	15	4	5	4	2
Mercury	10	3	—	4	3
Lead	78	63	15	—	—
Copper	1	1	—	—	—
Antimony	1	1	—	—	—
Caustic Potash	1	1	—	—	—
Ammonia	8	4	3	—	1
Soda	3	—	3	—	—
Lime	1	1	—	—	—
Phosphorus	17	5	6	1	5
Sulphuric Acid	11	3	5	2	1
Nitric Acid	8	3	1	1	3
Hydrochloric Acid	17	7	—	8	2
Oxalic Acid	26	2	—	13	11
Carbolic Acid	34	13	2	6	13
Opium, Laudanum, Morphia	116	56	28	20	12
Godfrey's Cordial	2	2	—	—	—
Winslow's Soothing Syrup	1	1	—	—	—
Soothing Syrup	1	1	—	—	—
Poppy Tea	1	—	1	—	—
Paregoric	1	1	—	—	—
Chloroform	5	3	1	1	—
Chlorodyne	6	3	3	—	—
Chloral	15	9	5	1	—
Alcohol	26	18	6	1	1
Ether	1	—	1	—	—
Camphor	1	—	1	—	—
Paraffin	1	1	—	—	—
Benzoline	1	—	—	1	—
Prussic Acid and Oil of Almonds	15	3	1	8	3
Potassium Cyanide	16	2	—	10	4
Strychnia and Nux Vomica	23	3	1	8	11
Vermin Killer	28	4	—	7	17
Belladonna	5	3	1	—	1
Aconite	4	2	—	—	2
Digitalis	1	1	—	—	—
Water Hemlock	1	1	—	—	—
Fool's Parsley	1	—	1	—	—
Lobelia	1	1	—	—	—
Tobacco	1	1	—	—	—

Name of Poison.	Total No. of Deaths.	Accident, etc,		Suicides.	
		Male.	Female.	Male.	Female.
Laburnum Seeds. .	2	—	2	—	—
Ergot	1	—	1	—	—
Yew Berries . . .	1	—	1	—	—
Savin	1	—	1	—	—
Putrid Meat . . .	1	1	—	—	—
Poisonous Fish . .	7	4	3	—	—
Liniment	2	1	—	1	—
Lotion	1	—	—	—	1
Overdose of Medicine	1	1	—	—	—
Gripe Water . . .	1	—	1	—	—
Sweet Nitre . . .	1	—	1	—	—
Oil of Tar	1	—	1	—	—
Disinfecting Fluid .	1	—	—	1	—
Crayons.	1	—	1	—	—
Kind of Poison not stated	67	12	18	19	18

The second reading of the Medical Acts Amendment Bill in the House of Commons stands as the fifth order of the day on Thursday next. But notice of motion that it be read that day six months has been given by no less than six different members.

* * *

The New Brunswick Legislature has recently passed a Pharmacy Act for that division of the Dominion of Canada. Under its provisions the New Brunswick Pharmaceutical Association is incorporated, and its provisions are described as being very similar to those in the Ontario Pharmacy Act, published before on p. 892. It appears, however, to differ in one important respect, in that although there is a schedule of poisons that can only be sold legally by qualified persons, there is no provision as to the registration of the sale of any of them. We hope shortly to receive a copy of the text, and will then refer to the Act more fully.

* * *

The City of Boston boasts of an "Inspector of Vinegar," whose last annual report to the city council has just come to hand. It appears that the standard for vinegar adopted by the inspector is an acidity equivalent to the presence of not less than 5 per cent. by weight of absolute acetic acid, and for cider vinegar, which is the variety most favoured in Boston, a fixed residue at 212° F. of not less than 1·5 per cent. of "cider vinegar solids." The report states that the means of determining whether any vinegar conforms to these required limits are simple and may be obtained from any dealer in chemical apparatus or from one of the apothecaries, and then goes on to describe how the acidity may be ascertained by means of a volumetric solution of soda and an alcoholic solution of phenol phthalein, and the residue by evaporation. But unhappily for the peace of mind of the amateur analyst who may aspire to test his own purchases it is afterwards hinted that the acidity may have a mineral origin and that of cider vinegar should give the reactions for malic acid.

* * *

In a recent report on the commerce of the port of Loanda, Mr. Consul Cohen says the natives of Angola smoke, besides tobacco, the leaves of a plant which they call "liamba." These leaves are alleged to produce highly stupefying and narcotic effects exceeding those following the use of opium, confirmed smokers, among whom are included many Europeans, becoming idiotic and useless in a few years. Mr. Cohen says he is not aware that any chemical analysis of the plant has yet been made.

* * *

According to an official statement the number of candidates who in the year 1882-3 became qualified pharmacists in the German empire was 315, of whom 139 qualified in Prussia, 59 in Bavaria, 52 in Saxony, 12 in Würtemberg, 14 in Baden, 5 in Hesse, 6 in Mecklenburg, 11 in the grand duchy of Saxony, 9 in Brunswick and 8 in Elsass-Lothringen. This shows a falling off as compared with the previous year for the second year in succession, whilst during the same time there has been a considerable increase in the number of medical men who have become qualified.

* * *

In a communication to the *Medical Tribune*, Dr. Kunze states that while passing through a large New York drug store in the third week of January, he was surprised to notice two open barrels filled with fresh roots of *Convallaria Majalis*. Upon closer examination and inquiry he found that these roots were from forced hothouse plants, from which the flowering stem and leaves had been cut off for the flower market, and that this practice of turning the exhausted roots to account was not uncommon. Under these circumstances Dr. Kunze thinks it is not surprising that physicians fail to obtain the results expected from the use of preparations of convallaria, and he suggests that the old astrologers, in requiring that a plant intended for medicinal use should be gathered under certain planetary influences, had the advantage in practice, since the gathering of the plant in the best possible condition was probably thus secured.

* * *

At the last meeting of the Philadelphia College of Pharmacy it was resolved that the museum, laboratories and hall of the college should be open daily for the inspection and use of visitors during the meetings of the British Association and the American Pharmaceutical Association in September.

* * *

A correspondent of the *Ceylon Observer*, in giving an account of a visit to Japan, says that the Japanese tradesmen are among the greatest adepts at adulteration in the whole world. Even in drugs they have begun to imitate foreign articles with complete success, save that the English labels occasionally baffle them. Thus in shops in the native quarter of Yokohama boxes labelled "Hallaway's Pills" are sold at ten sen (4*d.* to 5*d.*) a box, as the manufacture of Professor Holloway. A foreign resident mentioned that his servant having been sent to a foreign druggist for some magnesia went to a native store, in order to get his squeeze, and brought back what appeared to be roughly ground chalk.

* * *

It is announced that the first open surgical scholarship of the Society of Apothecaries of London has been awarded to Mr. Sidney Plowman, St. Thomas's Hospital.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The ordinary monthly meeting was held in the Society's Rooms, on Wednesday evening, May 14, Mr. Preston, the President, in the chair.

The Secretary, Mr. Newsholme, having read the minutes of the previous meeting, placed upon the table a sample of ginger mixed with nux vomica beans.

Mr. Newsholme said the sample was supposed to be African ginger. It weighed 4 ounces; out of this weight he had picked ¾ ounce of nux vomica beans or about 20 per cent. of the whole (7 lbs. containcd 1½ lb. nux vomica).

A paper was read by Mr. George Ellinor, entitled "A Short Description of some Cinchona Barks."

A discussion ensued, which was joined in by most present, and at the conclusion, a hearty vote of thanks was awarded Mr. Ellinor for his paper.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 15. Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificates were read for the first time:—W. T. Burgess, E. J. Caley, R. D. Courtney, M. H. Foye, W. F. Grace, Baron Ferdinand von Mueller, H. Rogers, A. J. Watts.

Dr. J. H. Gladstone then read a paper—

On Refraction Equivalents of Organic Compounds.—In this paper the author gives the results of observations which have been made from time to time since 1870. These results are contained in three tables giving the refractive indices, etc., of over one hundred and forty substances. Table I. contains the refractive indices of the liquid bodies from observations of the lines A, D, and H. Table II. gives a list of the solvents employed and the percentage amount of substance dissolved. Table III. gives the specific refraction, dispersion, and refraction equivalent of all the substances as deduced from observations and the theoretical refraction equivalent calculated from the values of the respective elements given below. The specific refraction is the refractive index for A *minus* 1 divided by the specific gravity or $\frac{\mu A - 1.}{d}$ The specific dispersion is $\frac{\mu H - 1}{d} - \frac{\mu A - 1}{d}$ or which is the same thing $\frac{\mu H - \mu A.}{d}$ The refraction equivalent is $\frac{\mu A - 1}{d} \times$ the atomic weight. The following are the values of the elements:—Carbon saturated, 5·0; carbon in C_nH_n, 5·95; carbon, double linked, 6·1; hydrogen, 1·3; oxygen, joined by single bonds, 2·8; oxygen, joined by a double bond, 3·4; nitrogen, 4·1; nitrogen in bases, NO_2, etc., 5·1; chlorine, 9·9; bromine, 15·3; iodine, 24·5; sulphur, joined by single bonds, 14·1; sulphur, joined by a double bond, 16·0 The author has not included in the tables the refraction equivalent calculated for the theoretical limit of the spectrum because of the increasing uncertainty as to the position of such a limit. The author then gives the data by which the refraction equivalents of the above elements are calculated and in conclusion draws special attention to two points, the phenomena of dispersion and the bearing of these optical phenomena on our views as to the structure of organic compounds.

Dr. Armstrong asked if Dr. Gladstone had used benzene prepared from benzoic acid, as Meyer had shown that all benzenes prepared from coal tar contained thiophene, and thus the refraction equivalent of carbon in benzene might be affected. He ventured to protest against the use of the terms double linked, double bonds, etc., which he trusted would soon become obsolete; it would be better to speak of carbon in the ethylenic condition, etc. He also thought it would be most important, if possible, to determine the specific dispersion as well as the specific refraction.

Professor McLeod suggested that some use might be made of Captain Abney's photographic results and that it would be better to determine the refraction of liquids at a fixed distance from their melting point rather than from their boiling point.

Mr. Turner then read a paper—

On the Estimation of Silicon in Iron and Steel.—The author has estimated the silicon in samples of iron and steel containing from 0·06 to 22 per cent. of silica by the various methods usually employed, and comes to the conclusion that the method suggested by Watts is most generally applicable, and gives, when slightly modified, accurate results The method (*Journ. Chem. Soc.*, Abstr., xlii., 1134) consists in passing dry chlorine free from air over the iron borings at a low red heat. The chloride of iron volatilizes and is condensed in the colder portion of the combustion tube, whilst the silicon chloride passes on and is decomposed by passing it through water, which on evaporation yields the silica. Any slag and the silicon contained in it remain behind in the porcelain boat unattacked. The improvement suggested by the author is the use of a Will and Varrentrapp's bulb to contain the water by which the silicon chloride is decomposed, the loss of the silica which used to adhere to the delivery tube and the beaker is thus avoided, as the bulb can be dried and weighed after the experiment. A table accompanies the paper, giving the results obtained by six different methods and six samples of iron and steel.

Dr. Tilden then read a—

Note on the Melting Points and their Relation to the Solubility of Hydrated Salts.—In a paper read before the Royal Society in June, the author, in conjunction with Mr. Shenstone, proved that a relation existed between the melting points of anhydrous salts and their solubility in water above 100°. In the present paper the author shows that a similar relation holds between the points of fusion of hydrated salts and their solubility below these temperatures. He has determined the melting points of many salts and gives the method by which the determinations were made. The temperature at which incipient fusion occurs is in many cases that at which the graphic curve representing the solubility suddenly turns upwards. In isomorphous salts containing the same amount of water of crystallization the solubility and the fusibility stand in the same order at all temperatures below the point of fusion. The most fusible being the most soluble. The author is greatly in want of experimental data as to solubilities and melting points in order to extend the subject further.

A Memoir Detailing some Minor Researches on the Action of Ferrous Sulphate on Plant Life. By Dr. A. B. Griffiths.—The author finds that 0·15 per cent. of ferrous sulphate added to a solution of various salts aids, whilst 0·2 per cent. is fatal to the development of mustard seeds, cabbage plants, and some microscopic water plants.

Note on Ferric Sulphocyanate. By A. J. Shilton.—The author finds that if a drop of dilute ferric chloride be allowed to fall into a solution of potassium sulphocyanide the red colour at first formed is completely discharged. Also that a liquid containing enough ferric sulphocyanate to render it almost opaque is completely decolorized if boiled with an excess of hydrochloric acid. These effects are readily explained by the fact that the sulphocyanide is a powerful reducing agent.

The Society then adjourned to June 5.

SOCIETY OF ARTS.

Fermentation and Distillation.

In the second Cantor lecture upon "Fermentation and Distillation," on the 19th inst., Professor Hartley mentioned that soluble can be easily distinguished from organized ferments by their solubility and indefinite infusibility in water. He also gave the results of analyses made of papayin by Wurtz, of pancreatin by Law, and of albuminous peptone by Henniger, which showed that all of them contained about 16·5 per cent. of nitrogen, 52·5 per cent. of carbon, and 7·25 per cent. of hydrogen. Though the action of these ferments is impeded by borax, organic substances known as antiseptics produce no effect. They combine energetically with mineral matters, especially phosphates, and though there is no apparent change during the fermenting action, their power is gradually lessened. Diastase may be obtained as a white powder from malt by extraction with water, heating the liquor and filtering, and then precipitating with absolute alcohol; it is found to amount to only about 1 part in 500 parts of malt. One-seventh of the diastase in raw malt, however, is sufficient to convert the starch into sugar, though sometimes one-fourth may be required, owing to a too high temperature, above 112° F., having been reached during the mashing process. If a saccharine solution of it be slightly warmed a turbidity and incipient ebullition ensues, afterwards resulting in a very energetic evolution of carbonic acid gas; a small quantity of yeast added to the solution quickens this action. If a solution of grape sugar be exposed to the air for some time, the same results are obtained. This action is due to the growth of small bodies of an oval shape, known as yeast, which multiply at an enormous rate. These bodies were shown in 1835 by Schwann to be living organisms consisting of a cell, in which is contained an albuminous fluid. In further experiments it was found that yeast and other germs are at all times present in the air, but that these germs must come in actual contact with the saccharine matter to cause decomposition. Various methods for the preservation of saccharine solutions from this decomposing action were described. If a quantity be boiled and the mouth of the vessel be plugged with cotton-wool after the expulsion of all the air, the wool acts as a kind of filter, preventing the ingress of the germs with the air upon cooling; a still more effective mode consists in constructing the mouth of the vessel with a series of sharp bends, in which the germs in the air entering are deposited or else killed by the steam issuing when boiled. The lecturer then showed the difference between badly fed and well-nurtured yeast. The germs of the former have a shrivelled, pitted appearance, and a very distinct outline. If these germs be placed in sweet wort, which contains a quantity of mineral, especially phosphate of potash, and nitrogenous food, they swell out and the outline gradually becomes more indistinct; it is further observed that the germs commence to bud, the buds growing rapidly and soon becoming detached. In the alcoholic ferment two distinct varieties of the yeast plant (*Saccharomyces cerevisiæ*) are found, whilst a third has been claimed to have been distinguished. Bottom yeast, which is found in the lower part of the fermenting vat, develops at a temperature of 43° to 50° F., and never rises to the surface, even if the temperature be raised to 68° F. It buds less rapidly than the higher yeast, and is principally used for lager beer. The yeast found near the surface of the vat consists of larger and fatter cells, forming at a temperature of from 60° to 68° F., though quite inactive at a lower temperature. Professor Hartley then enumerated the principal conditions for a successful fermentation. The saccharine solution must be of a suitable strength and contain sufficient phosphates and nitrogenous food; it is also necessary that the yeast plant should be in a healthy state. Attention must be further paid to the due proportion of yeast to sugar, as an excess of sugar precipitates the albuminous matter, whilst a want of it induces an irregular fermentation, which allows the introduction of other ferments producing other than alcoholic products. The fermentation of cane sugar occupies twice as long a period as that of grape sugar, as the cane sugar has to be inverted into glucose before being split up by yeast. The alcoholic ferment resolves the saccharose into glucose as dextrose or levulose, which is again resolved into alcohol, carbonic acid gas, glycerine and succinic acid; 100 parts of saccharose yield 105·36 parts of glucose, which split up into 51 parts of alcohol, 48·5 parts of carbonic acid gas, 3·16 parts of glycerine, ·67 part of succinic acid, and 1 part of cellulose, etc. Professor Hartley gave as the result of a yeast ash examined by himself, that it consisted nearly entirely of phosphate of potash with a slight trace of soluble silica; it is therefore apparent that without potash the yeast plant will not grow, the substitution of soda being of no use, though sometimes a magnesium salt is found in the ash. Beans and other legumes are sometimes steamed and added to the fermenting liquid, as they are rich in the needful nitrogenous food. The danger of the use of unhealthy yeast is the probable contamination with lactic or other ferments. The bacterium of the lactic ferment is the *B. subtilis*, resolving the glucose into lactic acid. Those of the butyric ferments are the *B. amylobacter* and *B. ethylicus*, resolving the glycerine into ethylic alcohol; *B. butyricus*, resolving the glycerine into butyric alcohol, butyric and lactic acids, and propylglycol; and the *B. Termo*, causing oxidation of organic matters generally. As all these organisms are smaller than the yeast plant it requires a microscopic power of not less than 700 diameters to examine them. Several methods are used for the purification of the yeast. The plant is grown in a 10 per cent. solution of sugar, in consequence of which the lower organisms are starved out from want of nutritious food, after which the yeast is transferred to sweet wort, where it speedily flourishes. In other methods the use of small quantities of tartaric, carbonic or salicylic acids have been advised. Yeast has also been taken from various sources and mixed, thus affording more chance of obtaining a pure yeast; but with all these precautions bacteria are sometimes introduced subsequently with the addition of the finings.

The concluding lecture of this course consisted principally of an explanation of the different modes of distillation, though some interesting remarks were made concerning the natural production of alcohol. The original yeast plant, possibly derived from the grape or hop vine, has been lost in cultivation. But besides this there are many other ferments that produce alcohol, those of rhubarb and dates especially causing a very rapid decomposition when heated. The iodine test for alcohol, producing crystals of iodoform, was described as sufficiently delicate to detect one part of alcohol in one million parts of water; by the use of this test it has been shown that organic decay leads to a continual production of alcohol in the earth, though it is far less in a sandy barren soil than in one containing much organic matter. Traces of alcohol have been found in nearly all water except that collected from some deep springs; rain water indeed has been found to contain 1 gram weight of alcohol in a cubic metre of the water. These results have been confirmed by experiments made by Captain Abney with the spectrum method. Mr. Hartley then explained the principle of the common still, and drew attention to the great loss of heat in the cooling method, which had first been successfully avoided on the manufacturing scale by the arrangement introduced by Laugier. His plan consisted in utilizing the heat abstracted during the cooling of the alcohol for the purpose of raising the temperature of the liquid to be distilled. The parts of the apparatus consisted of two stills, one being used as a rectifier, a dephlegmator, and a condenser. A more modified form of this apparatus, designed by Coffey, is at present in use in English spirit

manufactories for the distillation of fermented worts. In both these methods advantage is taken of the low boiling point and diminished latent heat of alcohol as compared with water to separate the alcohol, the strength being regulated by the rapidity of the distillation. It is further found that a comparatively stronger alcohol is obtained by the distillation of a wash containing a low percentage of alcohol. Thus if the wash consist of 90 per cent. alcohol, with a boiling point of 173° F., the distillate will contain 92 per cent. of alcohol; but if the wash only has 60 per cent. alcohol, the boiling point rises to 178° F., whilst the distillate contains 87 per cent. of alcohol or a comparative increase of 27 per cent. With a wash of 20 per cent. alcohol a distillate containing 71 per cent. or an increase of 51 per cent. is obtained. The well-known improvement in flavour consequent upon the keeping of whisky, etc., Mr. Hartley considered due to the conversion of some of the amylic compounds into ethers. In a homologous series of alcohols he mentioned methylic, ethylic, propylic, butylic, amylic, caproic, œnanthic, caprylic, rutic, lauric, cetylic, cerylic and melissic alcohols. He also pointed out the existence of the base C_6 in the composition of the aromatic benzene derivatives, consisting of benzine, cymene, benzoic, cinnamic and salicylic aldehydes, vanillin, anethol, thymol and eugenol. He then referred to the manner in which the barley-malt is dried as imparting a distinctive flavour to the spirit obtained from it, this being especally the case when dried over peat fires; the lecturer considered the flavour due to the formation of certain compounds which remain in the malt. In conclusion he gave the result of an analysis of a sample of Highland malt whisky. About 200 c.c. was taken and divided into eight equal fractions by distillation. The first four, distilled at 78° C., consisted of almost entirely pure ethylic alcohol, though a faint trace of butylic alcohol was noticed in the third fraction; the fifth and sixth fractions, distilled at 78° to 95° C., consisted principally of amylic compounds, whilst the remaining two fractions were chiefly water with a faint trace of amylic alcohol.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, May 15, Mr. H. G. Greenish, Vice-President, in the chair.

The following paper was read on—

The Botany and Materia Medica of Linseed.

BY E. H. EARLE.

The plant, known from the value of its products in manufactures and the arts as *Linum usitatissimum*, is an upright annual having a height of from one to two feet. The stem is smooth and green, and the leaves are linear lanceolate, alternate, and sessile. The calyx consists of five sepals which are ovate and acute, and have membranous margins. The corolla consists of five petals which are of much larger size than the sepals. They are somewhat crenated and are caducous. These petals are of a conspicuous purplish blue colour. Both stamens and styles are five in number. The fruit is a capsule, which dehisces septicidally; the carpels being divided from each other, and these again partially divide down the partition between each pair of seeds.

The native country of the flax plant is unknown, but central Asia has been mentioned as the probable source.

The plant is reared in this country in Lincolnshire, Cambridge, Suffolk, Devon, and Somersetshire. The seeds obtained from the two latter counties are held in highest esteem. In India the flax plant has been under cultivation for centuries for the seeds, whereas in Europe the fibre of the plant was more developed, as linen and not oil was desired.

Experiments have lately been made in India with Dutch and American seed, with a view to cultivating a good flax-yielding plant, but they have not as yet been very successful. This is said to be owing to insufficient moisture in the soil. The seeds are sown in the autumn. India also imports much European grown seed for the extraction of the oil, which possesses more satisfactory drying properties than that obtained from native grown seed. At least such is stated to be the case.

Flax being the more important of the products of this plant, I will allude to it first.

Flax has been known from the earliest ages. It constituted a field crop at the period when the Israelites were in Egypt, and the fibres were used for the manufacture of garments. Herodotus mentions this fabric as constituting articles of clothing amongst the Egyptians, upon whose monuments and tombs the processes which the fibre underwent for economic purposes are depicted with great accuracy. The clothes in which the mummies are wrapped are found to consist of linen, but of a very coarse texture. It was also used for filtering wine through, and a very rough or strong quality formed sails for boats, according to classical writers.

The Romans seemed to prefer wool to linen in the way of clothing. The emperor Alexander Severus is reported to have been the first Roman who had the courage to wear a linen shirt. After the fall of the Roman Empire flax-weaving was lost sight of until the tenth century, when it was started at Ypres in Flanders, and was from that time carried on in various parts of the Continent with varying success. I believe the celebrated Bayeux tapestry is worked on linen.

The seeds from which the flax plant is to be reared should be plump, heavy, and shining; and should be freed from impurities by sifting.

The soil answering best for its cultivation is a dry loam, and in good flax-growing soils silica is found to the amount of 60 per cent., or, in some cases, 80 per cent. Flax has always been notorious for exhausting in a high degree the soil from which it is raised. In the Georgics Virgil speaks of it as "scorching the fields." This was owing in a great measure to the cultivators not understanding the rotation of crops. Thus many districts are barren in Sicily and Asia Minor—once the granary of Rome—Spain, and the Campania, which were historically fruitful.

Irish grown flax is considered the best for the manufacture of linen, and there the crops are rotated so as to allow of an interval of about six years before again using the soil for flax. The first year grass is grown; in the second year oats; in the third year potatoes or turnips; in the fourth year wheat; in the fifth year flax, clover, or beans. In this way the soil suffers no harm.

In order to obtain a superior fibre for linen manufacture the plant is gathered before it reaches maturity, which is indicated by the partial change of the green stem to yellow, and of the green capsule to brown.

The stem consists essentially of a woody interior, and externally of the fibre needed for flax.

The plant is gathered and dragged through a rough comb, which separates the capsules, This is known as "rippling" it. It is next "retted," which operation consists in steeping it in soft water for about a fortnight, in order to dissolve out the gummy and resinous matters holding the woody and fibrous portions together. Ponds have to be dug out for the purpose of steeping the flax, as the plant renders the water so offensive that cattle drinking at a river or stream in which the operation had been conducted would be poisoned. In the reign of King Henry VIII. an Act was passed forbidding the pollution of river water by such means.

In Sweden the plant is boiled in sea water, together with lime and birchwood ashes, and finally washed with soap. This operation ended, it is "grassed" or laid out for sun-bleaching, being turned once or twice in order that all parts may experience the same influence. This occupies about a fortnight. It is then tied in sheaves or bundles and sun dried. It is often broken or

"scutched" before being sent into the market. This process consists in beating with mallets or flails until the adhering wooden portion is well broken up. This is now chiefly done by machinery. It undergoes in the mills many processes which are too intricate to be followed out in a paper of this nature, beside involving some technical education. After being "combed" or "heckled" in the mill in order to separate the fibres, flax presents long glistening silver gray or yellowish fibres resembling silk when viewed from a short distance. The fibres broken off short in combing constitute tow.

Flax is also imported from the Baltic ports, Holland and Belgium.

Scraped linen constitutes lint. There has been some discussion from time to time as to the superiority of lint over cotton in bandages. Cotton is more irritating, and this is said to be due to the cells, of which it is composed, being flat and having sharp edges, or by these flat cells twisting when wetted, in both cases proving uncomfortable to the patient. Flax cells, however, are cylindrical, and thus, having no sharp edges, are superior for dressings.

The seeds now come under our notice. They are small, brown and glistening; oval in shape and having sharp edges. They are official, being used for the infusion of linseed. They are used for food in some parts of Russia and Abyssinia.

The seed coats contain a mucilage, according to some writers, which exists in the *growing* plant as *starch*. The nucleus contains much fixed oil (about one-third the weight of the seed). It is when first expressed of a pale colour, but darkens on keeping. It consists chiefly of glycerides, together with fatty acids—notably, linoleic—to which the drying properties are due.

The seeds are obtained from St. Petersburg, Riga, Libau and other Baltic ports both in Russia and Germany, the Black Sea ports, Bombay, Calcutta, Italy, New York and La Plata in South America. The Baltic supplies the greatest amount and the La Plata seeds go chiefly to the Continent.

Linseed meal is officially directed to be obtained by powdering the cake from which the oil has been expressed. It is used as a poultice, which is often stated to have irritating instead of soothing effects. This may be due to the admixture of cruciferous seeds, such as rape and mustard. As the irritation was supposed to arise from the natural oil of the linseed becoming rancid, the meal is directed to be obtained—as stated before—from the *cake* and not from the seeds. Olive oil is directed to be added when a poultice is required, in order to replace the natural oil, which to say the least is an inconvenient arrangement.

Taking now the expression of the oil from the seeds as actually carried on:—The seeds are stored by means of an elevator at the top of the warehouse, and by means of a long wooden tube, a stream of this seed is poured into a large wooden box, which allows a regulated amount to pass in a continual stream between two almost solid steel rollers about 18 inches in diameter, and on emerging from between these the seed falls upon a sloping iron ledge which directs the steam between two more rollers, and so on, until by a course shifting from one side to the other, the seeds emerge finely ground, and constituting a true linseed meal.

The temperature of the room is about 90°, so that a more plentiful supply of oil should be yielded.

Machinery now carries the meal into a large tub-like arrangement known as the "kettle." A workman below waits with iron trays upon which are coarse cloths. These trays are about a yard long and a foot wide.

These trays are placed below the "kettle," from which, by means of a trap, a requisite amount of meal is deposited upon the cloth-covered tray. The meal is pressed just sufficiently to cause it to adhere together and it is then covered at the top by the ends of the cloth before mentioned, and the tray is then placed in a press by another workman, who accumulates a pile of about a dozen in the press in about ten minutes.

At the bottom of this pile of trays is a solid steel slab which now ascends and presses the cakes against the top of the press. The oil flows very freely into tanks below, which have only one small hole for the oil to run out of. This prevents a too rapid current, which would carry mucilage and other matter along with the oil, which runs through a series of tanks, always depositing until it reaches the large storage tanks, from which casks are filled for sale or export.

The press being loosened again, the trays are removed and the cake, now apparently quite dry, is divested of the cloth which was used to allow of the cake being more easily removed from the trays, and the edges neatly bevelled by means of a sharp knife running in a groove, which cuts the cake to the required shape and size.

The portions of cake trimmed off are ground up and worked over again.

These cakes weigh about 12 pounds and contain mucilage, phosphates and nitrogenous matter and about 4 per cent. of oil, which renders them of great service in cattle feeding.

The seeds I saw worked were Calcutta seeds and appeared remarkably free from admixture. Thirty-three per cent. of oil was extracted and 4 per cent. left in the cake, so these seeds yielded very good results.

Linseed oil may be divided into four kinds, raw, refined, boiled and artist's.

Raw oil is obtained in the manner just described.

Refined oil is raw oil allowed to stand for weeks or even months, to allow impurities to settle and then is treated with litharge or acetate of lead either when hot or cold. It is also sometimes heated with sulphate of zinc or alum, which is said to hasten the deposit of impurities. The lead is often separated with oil of vitriol and this bleaches the oil and also converts any lead into sulphate, which might, when mixed with paint as white lead, be converted otherwise into yellow oxide when exposed to air.

Boiled oil. Here the oil is boiled for about five hours, and then dryers are gradually added in the proportion of 5 pounds to a ton of oil. The whole is then boiled for an hour. After this the oil is left by some manufacturers until a pellicle forms, when the oil is then run off or ladled out. Some manufacturers allow it to stand for weeks until all the dryers have settled and the oil is clear and bright. The sediment and scum are used in putty. It is tested by dipping sized paper into the oil and seeing if a varnish is formed, on drying, over the *whole* of the paper. If only the bottom of the paper is varnished whilst the top remains greasy the oil is insufficiently boiled. The drying into a resin or varnish is seen to be due to the absorption from the air by oxygen, by spreading the oil over zinc plates and weighing. When a varnish is formed the weight of the oil is found to have increased by nearly one half.

Boiling oil was almost a traditional arrangement for promoting its drying; but black oxide of manganese and red lead were added with the idea of giving to the oil at a high temperature that amount of oxygen requisite to aid its commencement in absorbing oxygen from the air. The black oxide is said to part with oxygen, which it again absorbs on being stirred to the surface, over which a current of air is passing. Borate of manganese is also used. The pans in which the boiling takes place are of copper or iron, with an iron jacket, and are heated by steam. They have a dome cover, from which two fans or stirrers are arranged to stir up the oil. From the dome the irritating vapours of acrolein are conducted into bottles of water.

Lastly comes artist's oil. There are several kinds, which are made to suit private forms, and consist chiefly of heating the oil with acetate of lead and litharge, and bleaching with ferrous sulphate or by exposure to sunlight.

This paper was followed by one on—

The Chemistry of Linseed.

BY EDWARD CULLINAN, JUN.

The chemistry connected with linseed and its products is not only very interesting, but has received some very important technical applications.

Composition of the Seeds.—The testa contains an abundant secretion of mucilage; the cotyledons, a fixed oil. The average composition of linseed, as analysed by Dr. T. Anderson, shows the following results:—

Albuminous substances	24·24	parts in 100.
Oil	34·00	
Gum, sugar and cellulose	30·73	
Ash	3·33	
Water	7·50	

A more complete analysis of the seeds by Meyer gave the following results:—

Fat oil	11·265	parts in 100.
Wax	·146	
Acrid soft resin	2·488	
Resinous colouring matter	·550	
Yellow extractive and tannin	1·917	
Sweet extractive, malic acid and salts	10·884	
Gum	6·154	
Nitrogenous mucilage, acetic acid and salts	15·120	
Starch	1·480	
Albumen	2·782	
Gluten	2·932	
Husk	44·382	

The seeds are principally cultivated for the oil, but linseed cake, *i.e.*, the marc left after the expression of the oil, is also a valuable substance for feeding cattle. According to Voelcker's analysis* it contains:—

Oil	10·90	parts in 100.
Albuminous substances	24·56	
Mucilage, starch and digestible fibre	31·97	
Woody fibre	11·47	
Ash	6·20	
Moisture	14·90	

The proximate substances contained in the seeds may be conveniently divided into four: (1) mucilage, (2) albumen, (3) sugar, (4) fixed oil. Of these only Nos. 1 and 4 will be considered now.

Mucilage.—This is a universal constituent of plants, although found in some under different modifications. According to Thomé, linseed mucilage is formed by the conversion of the epidermal cells into mucilage by the excessive thickening of the cell wall; the innermost layers under the influence of water swell to an extraordinary extent and burst the outer layers, emerging from them as a transparent mucilage. It may, therefore, be considered as a product of the transformation of the cell-wall. It is contained in the testa of the seeds. It may be obtained from them by boiling with water (by which means it will be obtained in thick threads) or by shaking the seeds with acidulated water, filtering, heating to coagulate albumen, concentrating and precipitating with alcohol. It is less transparent and brittle than ordinary gum, insoluble in cold water or alcohol. In a dry state it contains about 10 per cent. of mineral substances, but if freed from these and dried at 110° C. it yields a formula corresponding to $C_{12}H_{20}O_{10}$ (similar to althæa mucilage. With boiling nitric acid it gives crystals of mucic acid. The mineral constituents contained in it are chiefly phosphates of potassium, magnesium, and calcium. The seeds yield about 15 per cent. of mucilage. It is a most useful material for luting stoppers and other such joints in glass works.

Fixed Oil.—This is obtained from the seeds with or without the aid of heat. Preliminary to pressing the seeds are crushed to a fine meal. For the finest quality of cold drawn oil this meal is enclosed in horse-hair envelopes and pressed either by means of wedges, in a screw press, or in a special form of hydraulic press. The cake left may then be submitted to heat and again pressed. Practically cold drawn oil is seldom prepared, but after the seeds have been ground they are roasted (to destroy mucilage) and the oil expressed. The yield of oil is from 23 to 33 per cent. According to Mr. E. Woolsey, the quantity of oil varies according to the weight, quality, and kind of seed used, and his experiments show that the quantity of oil extracted is from thirteen to twenty gallons per quarter, and that the seed known in commerce as "Best Odessa" yields the most oil. Ladurean states that Russian linseed grown in France becomes valueless after the second generation, and the ash is found to lose more than half its phosphates (*Chem. Soc. Journ.*, 1880). Elaborate descriptions of the machinery employed for extracting the oil may be found in Ure's 'Dictionary of Arts.'

When expressed without heat, linseed oil presents very little colour and no unpleasant taste, but the commercial oils are usually dark yellow with a peculiar taste and odour. According to Sassure's analyses it contains—

Carbon	75·17	parts in 100.
Hydrogen	10·98	
Oxygen	13·85	

corresponding to the formula $C_{15}H_{28}O_2$. Chemically it is a glyceride of linoleic acid. By saponification it yields glycerin and fatty acids, oleic, palmitic (Schuler), myristic and linoleic. If boiled for some time it loses weight, becomes thick, and dries up readily to a sold transparent varnish, called linoxyn ($C_{32}H_{54}O_{11}$). Heated to 323° C. it takes fire and leaves tar and charcoal, but if interrupted by closing the vessel, a brown turpentine body will be left, similar to bird-lime. Bromine and chlorine will combine with the oil at a temperature of 50° to 80° C., yielding dark brown liquids, known as brominated and chlorinated linseed oils, and having the formulæ represented by $C_{15}Br_2H_{26}O_2$ and $C_{15}H_{26}Cl_2O_2$. With H_2SO_4 (specific gravity 1·478) it is turned green; with strong sulphuric acid it is turned yellow-brown, coagulated and at last formed into a tough ropy mass, which, mixed with water or spirit, has been used for precipitating gelatin under the name of "Hatchett's artificial tannin." Exposed to the air it absorbs oxygen and forms a resinous mass called oxylinoleic acid ($C_{16}H_{23}O_5$), and this takes place much more rapidly if the oil be heated. In combining with oxygen it evolves much heat and has been known to cause the inflammation of cotton waste. It is soluble in 5 parts of boiling water, 32 parts of alcohol, and 1·6 parts of ether, and it will dissolve sulphur, selenium, arsenic and phosphorus. Sulphur dissolved in four times its weight of oil forms a brown viscid mass, known as "fatty balsam of sulphur." A solution (6 in 1) is contained in the non-official formulary of the Dutch Society for the Advancement of Pharmacy (*New Remedies*, 1882). Boiled with dilute nitric acid it becomes thick and hardens in the air to a substance possessing the property of softening in warm water and resembling caoutchouc.

The oil obtained from linseed belongs to that class known as "drying," and these are of sufficient importance to warrant our consideration.

Drying Oils.—This is a division of fixed oils which, when exposed to air, absorb oxygen and ultimately become converted into a yellowish supple varnish. They contain a glyceride different from non-drying oils and yield by saponification, linoleic or some similar acid. It is probable that they contain a glyceride of linoleic acid, stearin and palmatin, by the varying proportions of which their differences are determined. They are not solidified by treatment with nitrous acid and mercuric nitrate, and they are distinctly heavier than non-drying oils.

* *Journal Royal Agricultural Society*, 2nd series, vol. xvi., p. 659.

The following is a list of the principal drying oils, together with specific gravities and solidifying points :—

Cress seed oil . .	Lepidum sativum .	·924—15° C.
Deadly nightshade	Atropa Belladonna.	·925 – 27° C
Gourd seed . .	Cucurbita Pepo . .	·9231 – 15° C.
Grape seed . .	Vitis vinifera . .	·9202 – 11° C.
Hemp seed . .	Cannabis sativa . .	·93075 – 27·5° C.
Linseed . . .	Linum usitatissimum	·935 – 20° C.
Poppy seed . .	Papaver somniferum	·927 – 18° C.
Sunflower seed .	Heleanthus annuus.	·925—16° C.
Scotch fir . . .	Pinus sylvestris . .	·931 – 30° C.
Tobacco seed . .	Nicotiana tabacum.	·923 – 15° C.
Walnut seed . .	Juglans regia . .	·928 – 18° C.

Those in common use are linseed and nut, hemp, and poppy seed oils.

Linoleic Acid.—This acid belongs to the $C_nH_{2n-4}O_2$ group. Its formula is $C_{16}H_{28}O_2$ or $C_{15}H_{27}COOH$. It occurs in linseed and poppy seed oils, and probably in all drying oils. It may be prepared from linseed oil by saponifying, purifying the soap by salting out, dissolving in excess of water, and then throwing down by excess of calcium chloride. The precipitate, which is linoleate of calcium, is washed, pressed, and digested in ether, which dissolves it. The ethereal solution is decomposed by hydrochloric acid, linoleic acid being formed, which is soluble in the ether. The ether is then distilled at a low temperature in a stream of hydrogen, leaving impure linoleic acid. It may be purified by dissolving in alcohol, precipitating as a barium salt with ammonium chloride and barium chloride, washing, pressing and again dissolving in ether. This is then decomposed with hydrochloric acid, the ethereal layer drawn off, redistilled in a current of hydrogen and finally dried in a vacuum over sulphuric acid.

Mulder estimates it approximately by saponifying, dissolving the mixed fatty acids in alcohol, carefully evaporating, crystallizing out the palmitic and myristic acids and converting into lead salts. The oleate and linoleate of lead may then be extracted with ether, and the linoleate separated by repeated evaporation in air and resolution in ether (*Amer. Journ. Pharm.*, xl., 249).

Linoleic acid is a yellowish limpid liquid, insoluble in water, soluble in ether and alcohol, having a weak acid reaction. On exposure to air it oxidizes to a thick viscid mass. Its salts are very easily oxidized. Nitrous acid and mercuric nitrate do not form elaidic acid with it. The formula attributed to it is doubtful. If correct the acid is isomeric with palmitolic and homologous with sorbic ($C_6H_8O_2$) and stearolic ($C_{18}H_{32}O_2$) acids.

Uses of Linseed Oil.—The principal use of the oil is in the preparation of oil paints and varnishes, but it is also used in the preparation of linoleum, oil cloths, printing inks, and gummed silks. For painting and varnishing it is used either as raw or boiled oil. Boiled oil is prepared by boiling the raw oil for two hours, ladling off scum, and then adding a certain proportion of "dryers." The substances used for this purpose are kept as trade secrets, but they are generally composed of equal parts of minium and litharge, or a mixture of these with other substances, such as manganese dioxide, lead acetate. Messrs. E. Barruel and Jean recommend that the resinification be effected with manganese borate. After the admixture of "dryers" the oil is again boiled for some hours, and after cooling stored in tanks so that the uncombined dryers may settle to the bottom. The theory of boiling has been differently explained and is not understood. Liebig suggested that by the process the mucilage and foreign matters were removed; Chevreul, that the chemicals oxidize the oil and thereby induce a more rapid absorption from the air.

Adulterations of Linseed Oil.—The substances used for this purpose are very numerous. Not alone are the seeds mixed with other kinds before expression, but the oil itself is frequently sophisticated. Nearly all but the very best samples are impure. The principal adulterations are cotton, rape, poppy, and hemp seed oils and rosin, mineral and fish oils. These adulterations are very difficult to detect, although the following tests are useful in determining them :—

(1) *Density.*—The true oil varies from ·932 to ·937; boiled oil from ·940 to ·941. Mineral and seed oils are lighter, rosin oil is heavier. All the samples of commercial oils that I have tested have been lighter, and have varied from ·930 to ·931

(2) *Solidifying Point* of pure oil is – 27° C., but samples containing other seed oils freeze at a higher temperature.

(3) *Elaiden Test.*—This consists in treating the oils with nitric acid and copper, or nitrous acid and mercuric nitrate. The non-drying oils are converted into a more or less solid mass of "elaiden." By this means almond, olive, rape and castor seed oils may be detected. I exhibit a number of different "elaidens" obtained from different oils.

(4) *By passing Chlorine into the Oil.*—If fish oils be present the colour will change from brown to black. Fish oils may also be detected by the action of nitric acid. Ten grams of the oil suspected to contain fish oil may be treated with 3 grams of nitric acid, stirred and left to separate. Pure oil becomes green and then a dirty yellow green, whereas a mixed oil becomes dark brown and even black.

(5) *Flashing Point.*—A mixture of hydrocarbons with linseed oil always diminishes the flashing point. The true flashing point of linseed is 283° C., whereas Mason has found that samples of oil mixed with hydrocarbons present a flashing point as low as 128° C.

(6) *Behaviour with H_2SO_4.*—When 50 c.c. are mixed with 10 of strong sulphuric acid, a rise of temperature from 14° to 134° C. takes place, whereas with sunflower, poppy, olive, and almond, the rise in temperature is between 14° to 90° C. (Dragendoff's 'Plant Analysis,' translated by Greenish).

The principal adulterations of boiled oil are rosin and rosin oil. Allen states that the latter may be detected by titrating with alcohol and alkali, and extracting with ether. By evaporating to dryness the rosin may be extracted and recognized by taste and smell, and even in favourable circumstances presenting the physical characters of rosin.

Adulterations of Linseed Cake.—According to Holderfleiss, Ranuard and Corenwinder (*Journ. Chem. Soc.*, 1882–3) it is largely adulterated with rape cake, hemp and colza seeds, and other seeds belonging to the Cruciferæ. Rape and colza seeds may be detected by Maibho's test. Boil with potassium hydroxide, filter and test with lead acetate paper. A black colour indicates sulphur present in cruciferous seeds. The presence of these seeds, as stated by Greenish and others, is highly injurious in their use in medicine.

Much of my information has been derived from the works of Allen, Gmelin, Watts and others, and also from original papers by various authors, most of which have been acknowledged when referred to. I am also indebted to and desire to thank Mr. Dunstan for laboratory assistance, Mr. Earle for samples, and Mr. Walker for practical details.

The two papers gave rise to a discussion in which the Chairman, Secretary, Messrs. Dymond, Lowe and Short took part.

Votes of thanks were passed to Mr. Earle and Mr. Cullinan.

The Reporter on Analytical Chemistry, Mr. C. Thompson, then read a report on "The Separation of Cobalt and Nickel."

A discussion followed in which the Chairman, Secretary and others took part.

Miscellaneous business having been proceeded to, Mr. Thompson introduced the subject of the estimation of carbolic acid, which had formed the substance of a previous report by him, and stated that the method then

described by him (titration with bromine water) had been found to give too high results, probably from the precipitation of cresol and higher homologues by bromine water.

After some remarks on the subject by the Secretary, the meeting adjourned.

Parliamentary and Law Proceedings.

Suspected Death by Poisoning.

Some time ago an inquest was held at Ilfracombe on the death of Mr. James Shipway, a retired tradesman, who died under peculiar circumstances. He lived in the Torres, with two female servants as attendants. He was a cheerful man and of robust health for his age, but in March last he frequently was attacked with sickness. Dr. Foquett was called in, but Mr. Shipway died during one of the attacks. A *post-mortem* was made and the doctors could not account for death. They found the inward parts much inflamed and containing fluid of a dark bloody character, and their suspicion was that death resulted from irritant poison. The inquest was adjourned in order that an analysis might be made.

The inquiry was resumed on Monday, the 12th inst., at the Town Hall, before Mr. J. F. Brougham, Coroner.

The first witness called was Dr. Stevenson, of Guy's Hospital, and analyst to the Home Office. He stated that the dark fluid he found in the stomach was blood, but as the bowels had been cut open he was unable to determine the source of the blood, that was to say, whether it had been effused before or after death. Traces of antimony were found in the liver, too small to permit of accurate estimation; also a quantity of bismuth, an appreciable amount. The groats from which the deceased had been eating gruel were free from poison, but the lozenges stamped "Crowther," which the deceased had been eating, contained preparations of morphia and antimony. The medicines deceased had been taking were harmless; but the bismuth, a sample of which he had received from Dr. Foquett, contained a very minute trace of arsenic. The quantity of this, however, was too small to produce any appreciable effect, otherwise the article was pure. The only articles submitted to him which appeared to have any bearing on the case were the lozenges. The use of those accounted for the presence of the only noxious substance found in the body, namely, antimony, and the minuteness of the quantity of the metal in the viscera pointed to its administration in a small dose or doses, such as contained in the lozenges. The use of an excessive number of those lozenges within a limited period would cause nausea, feebleness of the heart's action, and possibly sickness and slight irritation of the bowels. One ounce of the lozenges per day would certainly be an excessive number. He had read and considered the evidence of Dr. Foquett and Dr. Fox, and having regard to that and to the facts of his analysis, he was of opinion that the death of the deceased was due to natural causes. He had known cases where the symptoms had been similar to those of Mr. Shipway, simulating irritant poisoning, and hemorrhage in the bowels, found after death where the cause was ascertained to be natural. There was nothing in the case to warrant the suspicion that deceased was poisoned by anyone or by himself, but the medical men were quite justified in refusing to give a certificate before an inquest was held and an analysis made.

Dr. Foquett was then called and subjected to an examination. He refused to say his suspicions were removed, contenting himself with remarking that as Dr. Stevenson had not discovered any irritant poison he supposed it was not there. Cases were on record where people had died from poison and yet no traces of poison had been found after death. In answer as to whether he thought the fluid in the stomach was blood, he said he did not think so.

The Coroner briefly summed up, recommending a verdict of death from natural causes.

Mr. Thorne also addressed and jury, and pointed out that as the housekeeper was known to be benefited under the will of deceased she had occupied an acutely painful position for many weeks past, and he asked the jury to express their sympathy with her.

This the Jury did, and said they were unanimous in their opinion that death was the result of natural causes. They were also glad to hear Dr. Stevenson say that the medical men were justified in refusing to give a certificate.

Review.

Elements of Pharmacy, Materia Medica and Therapeutics. Second Edition. By William Whitla, M.D.*

This work, which has reached a second edition, has undergone careful revision, though perfect accuracy has not in all cases been obtained. The sections on non-official remedies and chemical reactions have been re-written and extended. The manual has been arranged chiefly for the benefit of medical students, which may account for the detailed explanation of processes connected with dispensing, which will appear unnecessarily elaborate to those who are practically engaged in pharmacy.

The tabular method of conveying information will be found useful if only as a hint to students of the advantage of preparing similar tables for themselves.

The two most useful portions of the book are the chapters devoted to therapeutics and non-official remedies; the medical recipes which illustrate the former continue to render the treatment of this section clear and definite. No one can afford to neglect the study of the long list of substances which, though not officially recommended, are extensively prescribed.

So great attention is at this moment devoted to practical work, both in medicine and pharmacy, that we have separate treatises issuing from the press on several of the subjects included in this volume; but as a ready and comprehensive reference, Dr. Whitla's pages may be consulted with much economy of time. That probably was one chief object contemplated by the author in the compilation of this volume. Essentially it is an excellent guide to students preparing themselves for an examination, and may lay claim to concise teaching and well classified arrangement.

The author insists on the value to the medical profession of a practical acquaintance with the art of pharmacy, and regrets that a more intimate knowledge of this art is not cultivated by the student of medicine.

We may insist, on our side, on the value to the pharmacist of a more intimate acquaintance with the leading principles of therapeutics and posology.

The practice of pharmacy can never be adopted by the medical profession without unduly interfering with those onerous duties which demand their unremitting care; but a knowledge of the principles on which the art is based would instruct both the surgeon and the physician how to prescribe accurately and intelligently; while a general insight into pharmacy would infinitely widen the choice of remedies.

The practice of medicine can never be adopted by the pharmacist, for he does not possess the requisite qualifications. But to know the leading principles on which the science is based would deduct one chance of error, and would infinitely widen the area of his research.

Both parties would be in a truer relative position, and be better able to render mutual companionship and aid.

* London: H. Renshaw. Fcap. 8vo. Pp. 1-602.

Obituary.

Notice has been received of the death of the following :—

On the 1st of May, Mr. Joseph Malpas Oakey, Pharmaceutical Chemist, Preston. Aged 70 years. Mr. Oakey was a Founder of the Pharmaceutical Society.

On the 5th of May, Mr. Edmund Thornton Butler, Chemist and Druggist, King's Cross Road, London. Aged 52 years.

On the 14th of May, Mr. Frederic South Morris, Chemist and Druggist, Birmingham. Aged 57 years.

On the 18th of May, Mr. Hugh Davies Hughes Chemist and Druggist, Walworth, London. Aged 52 years.

BOOKS RECEIVED.

GRUNDRISS DER PHARMAKOGNOSIE. By F. A. FLÜCKIGER. Berlin: R. Gaertner. 1884. From the Publishers.

NEW YORK AND BROOKLYN FORMULARY OF UNOFFICIAL PREPARATIONS. By a Joint Committee of Delegates. New York. 1884. From the Committee.

THE EXTRA PHARMACOPŒIA OF UNOFFICIAL DRUGS AND CHEMICAL AND PHARMACEUTICAL PREPARATIONS. By W. MARTINDALE and W. W. WESTCOTT. Third Edition. London: H. K. Lewis. 1884. From the Authors.

Correspondence.

DR. REDWOOD'S LIQUID EXTRACT OF CINCHONA.

Sir,—Immediately after the Evening Meeting of April 2, I commenced some experiments with a bark by Dr. Redwood's process, and had obtained results which seemed of interest, when, in consequence of domestic bereavement, I was obliged for a time to discontinue them.

In the meanwhile Mr. Cownley published results which closely coincided with those I had obtained; he, however, as might be expected, has made a much more complete analysis of the various alkaloids than I have attempted. My apology for publishing this note rests in the fact that in the letter which Professor Redwood published in the Journal for May 10, he states "that the results obtained by Mr. Cownley are explicable only by assuming that the sample of bark he operated on differed very much from any I have employed." The bark that has been used in the following experiments cannot be objected to on these grounds, for by De Vrij's method it gave 4·625 per cent. of alkaloid, of which 0·72 per cent. was quinia and 2·932 cinchonidia.

In the same letter the Professor adds, "I attach much importance to the degree of comminution of the bark in treating it by this process," and he raises a doubt as to whether Mr. Cownley used a sufficiently fine powder. Now in the private proof of the paper which was issued before the meeting was held "Red Cinchona Bark in No. 60 powder" was directed to be used. At the meeting the Professor stated that with a powder of this degree of fineness percolation was sluggish and that he had since substituted bark in No. 40 powder with equally good results. On the day following the meeting I started, therefore, with bark of this degree of fineness. When the Journal appeared, however, the number of the powder was again altered, and the bark was ordered to be used in "No. 50 powder." It would thus appear that uncertainty as to the proper degree of comminution existed in the author's own mind.

1. *Preparation of the Dry Extract.*

With the exception that Dr. Redwood's verbal instructions, as given at the meeting, were followed, so that the bark used was in No. 40 powder, the process, as it afterwards appeared in the Journal, was strictly adhered to. The percolate no longer gave a precipitate with liquor sodæ when 11 pints had been collected. Upon diluting the concentrated liquid with water, the matter thrown out was extremely difficult to separate; it refused to settle after standing for several hours, and blocked the pores of the filter upon attempted filtration. After the lapse of fifty hours the whole had been filtered and washed. Again the process of drying on glass occupied much time, and when dry the extract adhered most tenaciously to the surface; if the glasses were removed for a few minutes from the hot chamber it was almost impossible to remove it with a knife. By scraping the warm glasses in the chamber fair scales were obtained. Considerable loss was entailed by this difficulty and only 3 ounces of dry scaly extract were obtained.

2. *Estimation of Alkaloid in the Dry Extract.*

Twenty grains of the extract dissolved in 1 fluid ounce of water treated with 3 drachms of liquor sodæ gave 0·069 grams or 1·062 grains of alkaloid equivalent to 5·31 per cent.

Ten grams of the extract treated by a modification of De Vrij's process gave 0·926 grams of alkaloid or 9·26 per cent.

3. *Amount of Alkaloid left in the Marc.*

One hundred grams of the dried marc gave by De Vrij's process 2·23 per cent. of alkaloid, showing that a little more than half the alkaloid present had been extracted by the dilute acid.

4. *Hygroscopic Property of the Dry Extract.*

To test the hygroscopic property of the dry extract obtained from this bark 2·492 grams of it was left exposed in an open dish for forty-eight hours, at the expiration of which the weight was 3·608 grams, showing an increase of 48·3 per cent.

5. *The Fluid Extract.*

Taking 9·26 per cent. as the alkaloidal strength of the dry extract the fluid extract was prepared according to the directions. The result was highly satisfactory, the product being an elegant aromatic extract of full aroma and bitterness, but which precipitated slightly upon dilution with water.

J. O. BRAITHWAITE.

Laboratory, 50, Southwark Street, S.E.

J. H. A.—(1) *Paris quadrifolia.* (2) *Equisetum arvense.* (3) *Lastræa dilatata.* (4) *Orchis mascula.* (5) *Luzula campestris.* (6) *Lastræa Filix-mas.* Ferns should be sent in fructification and with the lower part of the stipes showing the scales.

A. B. C.—*Lepidium Smithii.*

F. Moore.—*Ung. Pagenstecheri.*—The following is the formula of this ointment, as used in Vienna :—℞ Hydrarg. Oxyd. Flav., grana quatuor; Cold cream, drachmas duas.

J. W. W.—We are not aware that sulphurous acid is used for the purpose and should doubt its efficacy if it were.

A. C. Talbot.—The evolution of chlorine is due to the action of carbonic acid in the atmosphere in the presence of moisture.

Photographer.—Place the leaves in a boiling saturated alkaline solution and keep them there until your object is attained. Botanical specimens, not exceeding six in number on each occasion, may be addressed to the Editor.

W. Curtis.—If the nitrite of amyl is in the condition in which alone it should be dispensed the mixture will be colourless when prepared; but it will soon become coloured in keeping.

Manager.—In the Draft Pharmacy Bill there is a provision that would meet your wish.

A. P. S.—The L. S. A. degree does not make a person eligible as a member of the Pharmaceutical Society.

M. E. Allen.—Very much would depend upon the manner in which the articles are labelled and advertised. If you are in doubt you are recommended to submit your question to the Inland Revenue Authorities, who alone can answer it authoritatively.

Unique.—(1) A pharmaceutical chemist is entitled to claim exemption from jury service, but if he wishes to do so he must take care that his name is not improperly included in the jury list.

F. J. Foot.—(1) *Orchis Morio.* (2) *Calamintha Acinos.* (3) *Veronica Chamædrys.* (4) *Brassica Napus.* (5) *Cratægus oxyacantha.* (6) *Hieracium pilosella.*

David.—(1) *Anacharis alsinastrum.* (2) *Achillea Millefolium.* (3) *Veronica nederifolia.*

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Samuel, Liverseege, Shapley, Gandulph, T. C. H., C. J. B.

Hunyadi János

"THE RICHEST NATURAL APERIENT WATER."
Baron Liebig in "Lancet."

"Certain and Painless, Soft and Mild."
Prof. Von GARTNER,
Stuttgart.

"OF GREAT USE IN HABITUAL CONSTIPATION."
Medical Times and Gazette.

USES AND RECOMMENDATIONS.

Hunyadi János — As a Laxative and against Obstinate Constipation.

"Has remarkable success in all diseases for which aperient waters are used."
Prof. Bamberger,
University of Vienna.

Hunyadi János — Against Hæmorrhoids and Portal and Hepatic Congestions.

"Prompt, certain and without inconvenience."
Prof. Von Buhl,
Munich.

Hunyadi János — In Bilious Attacks and Sick Headaches.

"Favours the secretion and excretion of bile, and removes congestive and inflammatory conditions of the liver."
Prof. Alois Martin,
University of Munich.

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"I have used the HUNYADI JÁNOS WATER in many cases of the rheumatic and gouty diathesis with very marked benefit. In cases accompanied with great obesity I prefer it to any other laxative."
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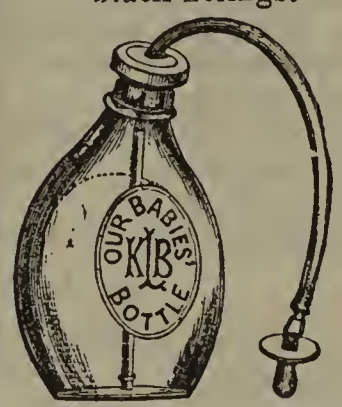

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AS JUNIOR. Age 20. 5 years' good experience. Good references. W. KNIGHT, St. Martin's, Chichester.

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IMMEDIATELY.—A Junior ASSISTANT, about 22 years of age, of good appearance and address, for a light Retail and Dispensing business of a superior class. Must be a reliable Dispenser and write a good hand. Apply, stating full particulars and enclosing carte (to be returned). W., Edwd. Pearson, Nottingham.

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IMMEDIATELY.—A competent ASSISTANT, in-door, to take charge of a suburban business. Apply, stating age, height, salary required, send references, and enclose photo, JOSIAH BLACKWELL, Pharmaceutical Chemist, 197, Moseley Rd., Birmingham.

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WHOLESALE.—A young man as Junior WET COUNTERMAN. Apply BURGESS, WILLOWS & FRANCIS, 101, High Holborn, W.C.

JUNIOR, Improver, or Turnover. Churchman preferred. HEYNES, Maidenhead.

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AN ASSISTANT, by the 23rd of June, for a first-class Family and Dispensing trade, of gentlemanly appearance and address. Apply, stating age, height, &c., WILLIAM JERVIS, Broomhill, Sheffield. Letters not answered in four days consider declined.

BY the 27th of June, for a Permanency, one only kept, a thorough competent ASSISTANT, age 26 to 30 years, married preferred. Good Prescriber and able to Extract Teeth. First-class references indispensable. Salary to commence at £130, and percentage, with house and gas included. Apply, personally, or if by letter enclosing carte, to CHARLES COWLES, 37, Broadway, Stratford, London, E.

A COMPETENT ASSISTANT (early), not under 22 years of age, of good address and experience. One with Minor qualification and desiring a permanent situation preferred. Apply, personally if possible, to W. BOWER, Pharmaceutical Chemist, 96, Tottenham Court Rd.

ASSISTANT, with Minor qualification. Accustomed to Dispensing. To board in house, but provide own sleeping accommodation. Apply, stating usual particulars, to SHARPE & SON, 34, High St., Notting Hill, London, W.

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The Pharmaceutical Journal AND Transactions.

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 11 a.m., on the second Tuesday in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

Each Candidate must state at which of the following centres he desires to present himself:—

Aberdeen	Cheltenham	Inverness	Norwich
Birmingham	Darlington	Jersey	Nottingham
Brighton	Douglas, Isle of Man	Lancaster	Oxford
Bristol	Dundee	Leeds	Peterborough
Cambridge	Edinburgh	Lincoln	Sheffield
Canterbury	Exeter	Liverpool	Shrewsbury
Cardiff	Glasgow	London	Southampton
Carlisle	Guernsey	Manchester	Truro
Carmarthen	Hull	Newcastle	Worcester
Carnarvon		Northampton	York

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An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, may be obtained from the Secretary, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

* A Certificate of having passed any of the examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

The Certificate must be forwarded to the Registrar, with the fee of Two Guineas, for the approval of the Board of Examiners, and must be so approved before the Candidate is eligible to enter his name for the Minor Examination.

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Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

Price 1s., or post free, 1s. 5½d.

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FOR 1884.

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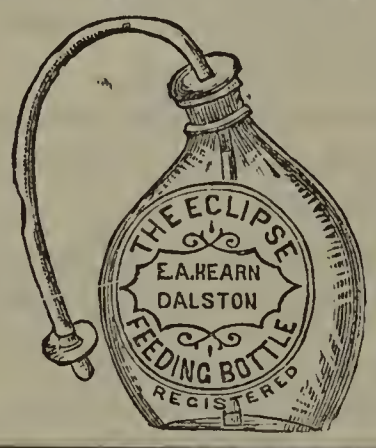

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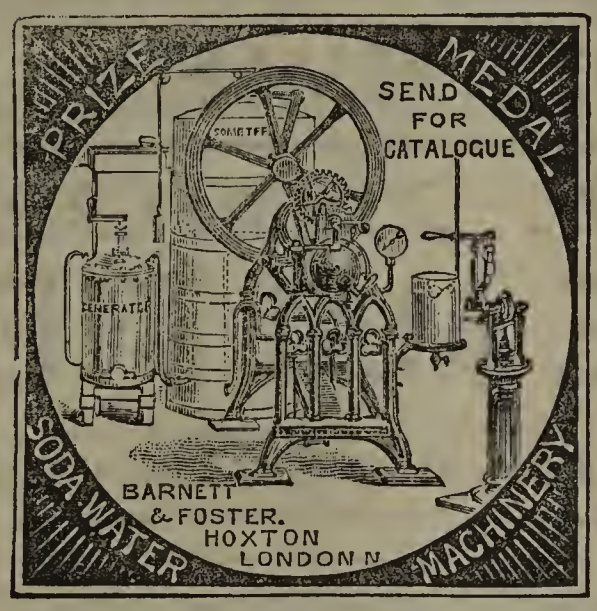

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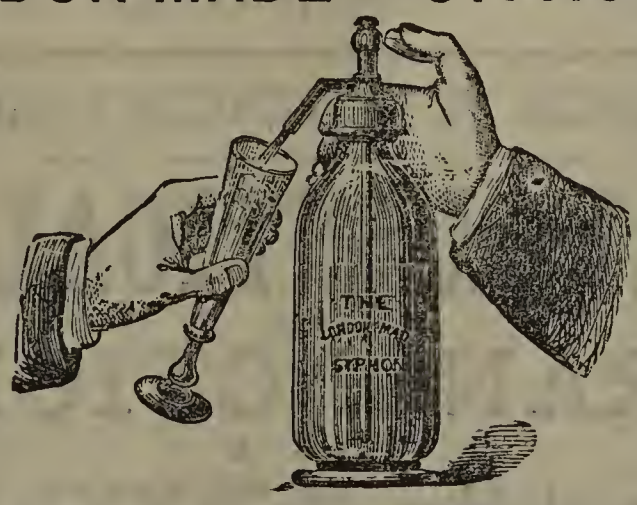

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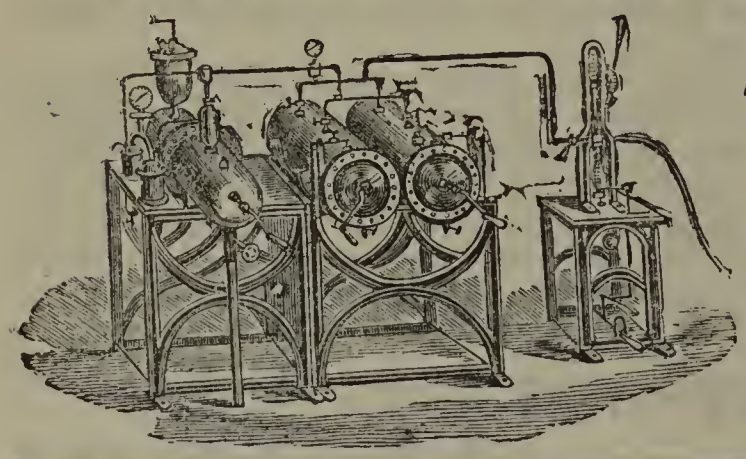

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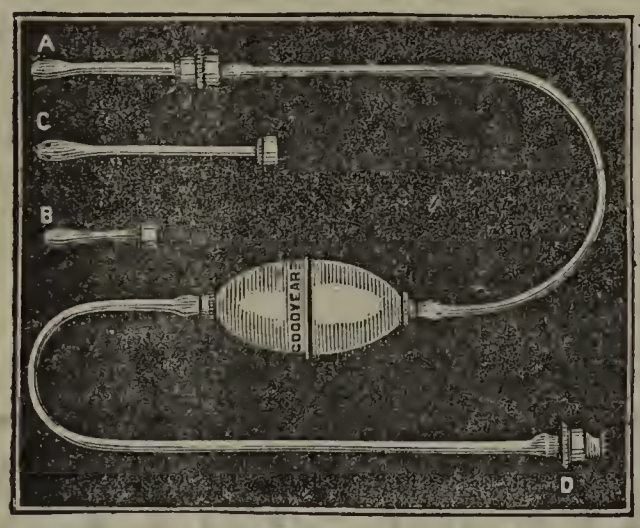

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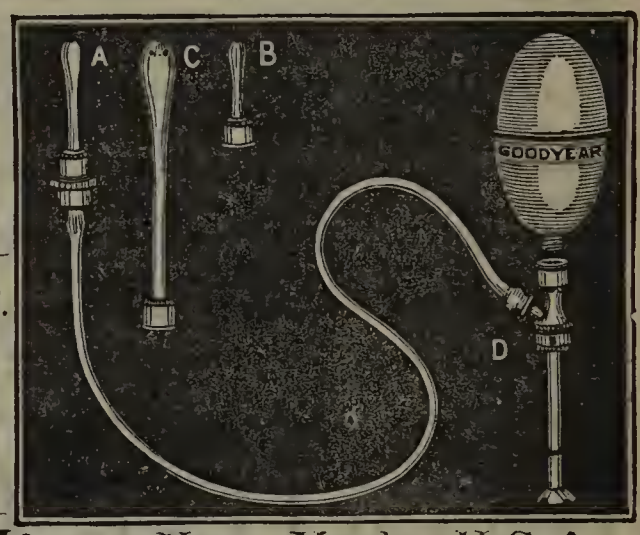

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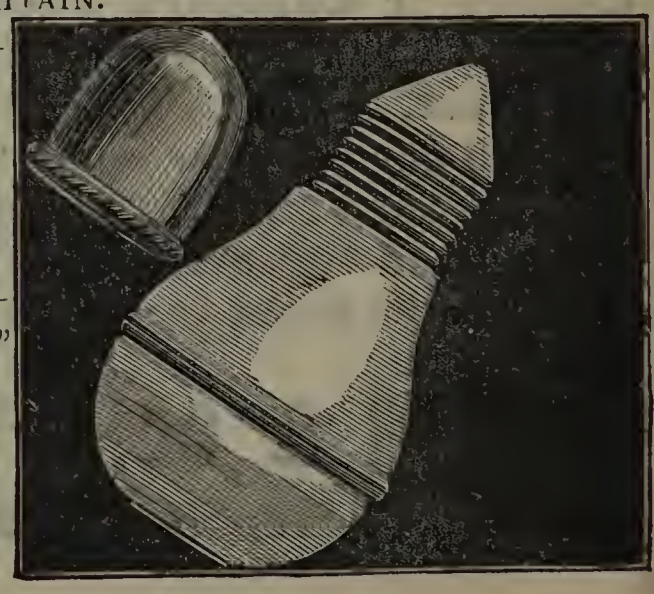

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THE ESSENTIAL OILS OF BLUMEA LACERA, DC., AND SPHÆRANTHUS INDICUS, LINN.

BY W. DYMOCK.

These two plants attract attention in India during the cold weather by their abundance on waste ground and in fields after the harvesting of the rice crop. The *Blumea* has a powerful camphoraceous odour, and *Sphæranthus indicus* a rose-like perfume.

B. lacera is a perennial plant, with obovate, deeply serrated leaves and yellow groundsel-like flowers, the whole plant being thickly clothed with long silky hairs. The natives of the Concan, near Bombay, call it *Nimúrdi*, and make use of it to drive away fleas and other insects. One hundred and fifty lbs. of the fresh herb in flower was submitted to distillation in the usual manner with water, and yielded about 2 ounces of a light yellow essential oil, having a specific gravity of 0·9144 at 80° F., and an extraordinary rotating power, 100 mm. turning the ray 66° to the left. Mr. D. S. Kemp, who made the observation, checked it by examining a 10 per cent. solution in alcohol, which gave 6·6.

This *Blumea* is of interest as the possible source of an insect powder. I am forwarding a supply of the plant and a specimen of the oil to Mr. Holmes for experiment and also for identification, as the genus is a difficult one.

Sphæranthus indicus is an annual with sessile, decurrent, obovate, bristly serrate, downy, glutinous leaves, and globular heads of purple flowers. It is a well-known Indian medicine, under the names of *Múndi*, *Gorakhmúndi*, *Munditika*, *Murmuria* and *Kottak-karandai*, and is reputed to be a general tonic, deobstruent, alterative and aphrodisiac. The distilled water is recommended for use and also the root. One hundred and fifty lbs. of the fresh herb was distilled with water in the usual manner and yielded a very deep sherry coloured, viscid essential oil, very soluble in water, and clinging to the side of the vessel, so that only half an ounce could be collected. The oil does not appear to have any rotatory power, but it is difficult to examine on account of its opacity.*

Bombay, May, 1, 1884.

THE CHEMICAL PHARMACY OF THE NEW PHARMACOPÉE FRANÇAISE.

(*Continued from page* 919.)

Sulphur and the mode in which its preparations are described form a good illustration that the new Codex may lay claim to being more than an amended edition of a preceding work. It will be interesting to see the manner in which precipitated sulphur, (soufre précipité) is directed to be made.

Slaked lime has been rejected, and ordinary water (eau commune) gives place even here to aqua destillata. This absolute choice of eau distillée has raised the ire of French commentators.

Sulphur Præcipitatum. Magistère de Soufre.	
Monosulphuret of sodium, in crystals . .	240
Sublimed sulphur	128
Distilled water	200
Hydrochloric acid, pure	230

Put the sodium sulphide, sulphur and water, into a glass vessel of about the capacity of a litre, and raise nearly to ebullition over a sand-bath. As soon as the sulphur has quite dissolved, dilute with water and filter into a precipitating vessel of a capacity of from 5 to 6 litres. Bring up the volume to about 4 litres. Pour into this hydrochloric acid previously diluted with 4 parts of water. Pour the acid into the liquid, not the liquid into the acid. The mixture must be well agitated so that the acid should nowhere be in excess as regards the polysulphuret. Continue to add the acid, stirring always until a distinctly acid reaction is produced. Conduct the operation in the open air so as to avoid the fumes of sulphuretted hydrogen.

The whole of the sulphur is thus precipitated. Pour off the supernatant liquor; wash with boiling water until solution of silver nitrate gives no reaction. Dry and keep. Precipitated sulphur thus made is in a state of fine division, but not entirely free from the odour of sulphuretted hydrogen in spite of repeated washing.

Soufre Doré d'Antimoine (golden sulphuret of antimony) is retained, though described anew.

Kermès Minéral (oxysulfure d'antimoine hydraté) is not yet to pass away from continental pharmacy. It is prepared by precipitation, called Cluzel's method, the only one to be employed in medicine. Kermes made by fusing sulphuret of antimony, sulphur and potassium carbonate is reserved for veterinary practice.

Numerous sulphates and sulphurets are in the list, some which should be relegated to a manual of chemistry; in England we trust more to individual skill and less to official definition. Consequently many chemical substances have been omitted in this review; not because they are deemed unimportant, but, with our independent habits, their authorized formulæ are of minor interest.

The cinchona series has been the subject of a completely new investigation, and even when the old titles have been retained, the descriptive portion and methods of testing purity are of modern date.

This branch of pharmaceutical chemistry would be unfairly treated in brief abstract, and it must only be remarked that two novelties are, the sulfate de cinchonidine basique (needle-like crystals containing 6 equivalents of water) and sulfate de quinidine basique, not unlike in appearance the ordinary quiniæ sulphas.

Charbon animal purifié (carbo ossium acido depuratum), ordered in certain of the cinchona preparations, must invariably be used purified, owing to the calcium salts always found in the animal charcoal of commerce.

Charbon végétal (carbo ligni) is stated to have the greater absorbent power in proportion to the hardness of the wood from which it has been prepared.

Sulfovinate de Soude (ethyl sulphate of soda) has now a recognized position; the sulphovinates enjoyed a passing fashion in English prescribing.

The chlorhydrates will be noticed subsequently; the chlorures (chlorides) have been much extended.

Of these latter, the Chlorure Ferreux Cristallisé (ferrous chloride), not a very convenient preparation in itself, is a simple solution of iron filings, Tournure de fer, or Pointes de Paris, in hydrochloric acid, the iron being in excess. Filter, evaporate and crystal

* Specimens of the plant and oil are being forwarded for the Museum.

lize. It is probably inserted for the preparation of the Chlorure Ferrique Dissous (liquor ferri perchloridi) made by dissolving the above crystals in water to a density of 1·10. Through the solution is passed a current of washed chlorine, till there is no blue precipitate by potassium ferricyanide. Concentrated solution of ferrous chloride is then added until no trace of chlorine is observed, care being taken not to add excess. The solution of ferric chloride is reduced to the density of 1·26 by addition of distilled water. Various lower strengths may be obtained on further dilution.

Fer Réduit (*Ferrum reductum*) has long been a favourite continental remedy. This is one of the few substances which remains described in almost the same words as in the Codex of 1866.

It is essential that the hydrogen employed should be absolutely free from sulphuric or sulphurous acids, else the contained sulphur, acting on the iron would give black sulphuret.

Moreover, the temperature must be nicely regulated. If reduction takes place below a dull red heat, the product is black and pyrophorous. If at a bright red heat, the iron particles cohere, and the requisite fineness is not obtained.

Ferrocyanhydrate de Quinine is a new introduction. The salt is described, but no process given.

Chlorure de Mercure (calomel) by volatilization; *Chlorure Mercureux Précipité* (white precipitate), and *Chlorure Mercurique* (corrosive sublimate) are all three supposed to be prepared by the pharmacien, full details of manufacturing process being given. A distinction in synonym used to be drawn between mercure doux (calomel obtained by sublimation); and calomel à la vapeur; both synonyms now apply to the one formula of the Codex.

Chloral Hydraté belongs to comparatively modern chemistry, and is now official. *Chloroform* is not a new introduction, but its mode of preparation and chemical characters have been written afresh, with indications of processes of purification to obtain it for anæsthetic purposes, and for medical use generally.

Acide Chrômique Cristallisé, replaces the old solution, and the Chrômate (bi) d'Ammoniaque has been added.

Citrate de Magnésie is what its name implies, and must not be confused with other preparations of a somewhat similar title belonging to galenical pharmacy.

Ethers are five in number:—Éther acétique, process and characters given. Éther amyl-nitreux (amyl-nitrite). Éther brômhydrique (ethylic bromide), process and characters given. Éther iodhydrique (ethylic iodide), process and characters, and éther officinal or pure, elaborate details of process and arrangement of apparatus being described.

Éther Rectifié du Commerce, commonly called sulphuric ether, is of two kinds, the first having a density of 0·724, and a second whose density is 0·735, but it is not sufficiently rectified, and contains water; about 8 per cent. of alcohol, and often other impurities. It should be reserved exclusively for veterinary use.

Glycerine has been removed from the list of materia medica, and placed in the chemical section; its applications belong to galenical preparations. When officinal or purified for medicinal use it should be free from colour and smell, with a sweet taste, and with no after bitterness. Density 1·242. On combustion it should leave no residue. Soluble in all proportions in water and alcohol, but insoluble in ether and chloroform. Its adulterations are, water in excess, dextrine, glucose, syrup and honey. In veterinary pharmacy there is an iodized glycerine (Glycérine Iodée, Trasbot.), made of equal parts of tincture of iodide and glycerine.

A new preparation is presented under the name of:—

Glycyrrhizine Ammoniacale.
Glyzine, Glyzina.

Rad. Glycyrrh. (Smyrn.)	200
Aq. destillat.	800
Acid. sulph. pur.	4
Liq. ammon. pur.	3

Bruise the liquorice root so as to reduce it to a sort of stringy tow, and macerate for four hours with twice its weight of cold distilled water. Press and strain and treat the residue in the same manner. Allow both macerations to deposit, decant, raise them to the boiling point, and filter them in order to separate the coagulated albumen. Unite the liquors, and when quite cold pour in by degrees sulphuric acid previously diluted with four times its weight of water till no further precipitate is produced.

This precipitate, at first gelatinous and flocculent, soon coheres strongly and forms a semi-soft mass at the bottom of the vessel. Pour off the supernatant liquor; wash repeatedly, and well knead the mass until completely free from acid.

Dissolve over the water-bath in the smallest possible quantity of liquor ammoniæ, diluted with an equal weight of water.

Thinly spread the solution on plates or glass, dry at 40° C. (104° F.) and scale. Colour, reddish brown, and translucent if the scales are not too thick.

Glyzine is completely soluble in distilled water, communicating to it an amber tint; sugary taste, much like that of rad. glycyrrhizæ, and it froths on agitation. It is insoluble in strong alcohol and in acid liquids.

Good Smyrna root should give from 6 to 7 per cent. of glyzine.

Iodhydrate d'Ammoniaque is our ammonium iodide, the remaining iodides being the mercurous, which is ordered to be prepared only in small quantity to avoid the danger of over-heating, and mercuric iodide, and the iodides of lead, potassium and sodium. Ferrous iodide now belongs to pharmacy proper, and iodide of sulphur has dropped out of existence.

Lactic acid is distinctly intended to be prepared at home, as not only a process is given for its manufacture, but the mode of its purification is indicated so that it should be in a fit condition to make the lactates which are specified further on. It must be confessed that in this respect we admire the French system of pharmacy, and believe that to a considerable extent the practice might be copied with advantage by ourselves.

The lactates are five in number: Lactate de chaux (lactate of lime) is purified for use. Lactate ferreux (lactate of iron) and lactate de zinc are the old preparations of 1866, but lactate of quinine is new. It is made by mixing powdered quinine hydrate in sufficient water; heating to the boiling point and adding enough lactic acid to dissolve the quinine, and to give a feebly acid reaction. Filter boiling and crystallize.

In appearance the salt much resembles the official sulphate. It is soluble in 3 parts of cold water, and in less than its own weight of boiling water. Very soluble in alcohol at 90°, and almost insoluble in ether.

Lactophosphate de Chaux en Solution (Liquor calcis lactophosphatis).

Phosphate of lime (neutral) . . .	17 grams.
Lactic acid, pur.	about 19 grams.
Aq. destillat.	964 grams.

Carefully suspend the phosphate in the water; add the lactic acid and allow a few minutes for solution to take place. Filter. Twenty-five centigrams of neutral phosphate of lime are contained in 15 grams of the solution.

Mercury, as obtained in commerce, should be reserved exclusively for mercurial preparations intended for external use. For other purposes it must be purified by nitric acid, diluted with twice its volume of water. Keep it in contact for four and twenty hours with frequent shaking. Decant the supernatant liquor; wash and dry.

Oxygen gas comes once more into the domain of pharmacy, and is ordered to be prepared from potassium chlorate and manganese dioxide.

The oxides, which we generally term such, are about ten in number, and are familiar to English pharmacy.

Oxyde (Sesqui) de Fer Bi-Hydraté, or ferric hyhydrate, is to be prepared by the addition of liquor ammoniæ to solution of perchloride of iron, both previously diluted. A reddish-brown precipitate is formed with alkaline reaction. Collect and wash till the water used, acidulated by nitric acid, has no effect on silver nitrate. Hydrated peroxide of iron is to be kept as an antidote to arsenious acid; and the more freshly prepared the better. Experience would suggest the advisableness of extemporaneous manufacture: its keeping properties are small.

With regard to Oxyde Mercurique Rouge, or red precipitate, when heat is too long employed the oxide is decomposed into oxygen and mercury. On the other hand when not heated sufficiently to decompose all the nitric acid used, an oxide is obtained mixed with subnitrate of mercury. This second inconvenience is to be more carefully avoided than the first. Oxyde de Zinc is prepared both by calcining hydrocarbonate of zinc obtained by precipitation; and by the direct calcination of metallic zinc. The first process is called par voie humide; and the second, par voie sèche, the result being Fleurs de Zinc.

Acting probably on the theory that pepsine is now well known and that the literature of the subject is abundant, the short essay contained in the former Codex has been abandoned; no process for its extraction is supplied, and only a test of purity is appended.

Pepsine médicinale is described as a greyish-white powder which is a mixture of extractive pepsine and starch.

Extractive pepsine is made from the stomachs of pigs, or from the rennets of sheep or calves. It should dissolve in water without sensible residue.

A variation of the old test is given in which hydrochloric acid replaces lactic acid; and 50 centigrammes, instead of 25 centigrammes, of pepsine should dissolve 10 grams of fibrine.

Test for Medicinal Preparation.

Put into a small wide-mouthed bottle—

Medicinal pepsine	50 centigrammes.
Aq. destillat.	60 grams.
Acid. hydrochloric. pur. . .	60 centigrammes.
Fibrine (pig) washed and freshly dried	10 grams.

Place the bottle in a hot water drying closet, temperature up to 50° (122° F.) and digest for six hours with frequent agitation till the fibrine is quite dissolved. Ten c.c. of the cold filtered solution should not be affected by the addition of from 20 to 30 drops of nitric acid.

Extractive pepsine (that is the unmixed article) should require only 20 centigrammes to produce the same result.

(*To be continued.*)

QUINOVIN AND QUINOVIC ACID.*

BY C. LIEBERMANN AND F. GIESEL.

Notwithstanding the occurrence of quinovin and quinovic acid in most if not all species of china and cinchona barks and their varieties in considerable quantities (up to 1·6 per cent.), both compounds have only been imperfectly investigated. The older work of Pelletier and Caventou, Winckler, Petersen and Schnedermann, did not go much beyond the preparation and analysis of quinovin, and it is to the investigation of Hlasiwetz that some further conclusions as to the glucosidal nature of quinovin and respecting its decomposition product, quinovic acid, are due. The object which the authors sought to attain was to throw some light upon the chemical nature and formulæ of these compounds, and the present paper contains a preliminary statement as to the results.

The quinovin used in the experiment was a waste bye-product in the manufacture of quinine, obtained when the cinchona alkaloids are extracted with alcohol. The bases and their salts, together with quinovin and numerous other compounds, pass into alcoholic solution. Upon distilling off the alcohol from the filtrate, and treating with a dilute mineral acid, only the bases in the state of salts are dissolved from the residue by water, leaving a brown resinous mass, insoluble in water, which was the raw material used.

This insoluble substance was digested with milk of lime at a moderate temperature and the filtrate precipitated with hydrochloric acid. The pale yellow precipitate was dried and digested with alcohol, when a small quantity of quinovic acid remained undissolved as a white powder whilst the greater part of the mixture went into solution with a brown colour. Upon diluting this solution with water until a precipitate commenced to form and allowing it to stand for some time a separation took place of small, slightly coloured crystals of quinovin. A single recrystallization from dilute alcohol was usually sufficient to obtain it free from quinovic acid, in the form of small glittering white scales. The yield of the pure product is not very favourable (about 26 per cent. of the crude material), as a considerable proportion of the crystallizable quinovin is kept in solution by the amorphous products. This can be proved by the fact that boiling hydrochloric acid will still split off from it a considerable quantity of quinovic acid, for which the mother-liquor may, therefore, be worked.

A resinous raw material obtained from other barks in a precisely similar manner yielded, however, no quinovin. This was the case when cuprea bark, derived from the nearly allied species *Remijia*, was used. The alcoholic solution of the resin, diluted with water, could not be

* Abstract of a paper read before the German Chemical Society (*Berichte*, xvi., 926).

brought to yield crystals, notwithstanding that the formation of a considerable quantity of quinovic acid upon heating it with hydrochloric acid implied the presence of a large quantity of quinovin. Eventually the separation of the body yielding the acid was effected by converting it into an ammonia compound. The alcoholic solution was treated with the requisite quantity of strong ammonia and heated, when after a short time the whole mass formed a crystalline paste of the ammonia compound in fine needles. This was freed from mother-liquor by pressure, decomposed with acetic acid to take up the ammonia, dissolved in alcohol and the ammonia compound again formed and decomposed. Upon then diluting the alcoholic solution with water to the point of turbidity, a crystallization of fine white needles resulted. A further investigation showed that this substance obtained from cuprea bark agreed with the quinovin previously studied in composition and in splitting off quinovic acid, but that it was not identical with it, though probably an isomer. It was therefore named β-quinovin.

The authors, having been able to prepare a considerable quantity of these two compounds in a crystalline condition (quinovin having been represented by most previous writers as an amorphous substance), were able to study them and their derivatives advantageously.

α-Quinovin is described as a white, very light crystalline powder, readily reduced to a dust. It is quite insoluble in cold water and almost insoluble in hot, but is soluble in cold aqueous solutions of the alkalies and ammonia, in milk of lime and baryta water. In benzol, chloroform and absolute ether it is very difficultly soluble; but it dissolves more readily in dilute alcohol, and is separated from it, upon a suitable addition of water, in glittering white scales. From stronger alcohol it separates in rosettes of clear very small needles. It is very freely soluble in 98 per cent. alcohol, especially when warmed gently, 100 parts of alcohol dissolving at 15° C. more than 43 parts of α-chinovin, without any separation taking place upon standing. Upon evaporation of the alcohol over sulphuric acid the whole dries finally to a gummy mass, without any separation of crystals. α-Quinovin in solution has a dextro-rotatory action: $a = +56{\cdot}6$. It does not reduce Fehling's solution, and does not undergo fermentation with yeast. It is a very stable compound, some raw material having been found unaltered, after having been kept six years. Powdered quinovin has a very bitter taste. In concentrated sulphuric acid it dissolves, under evolution of carbonic oxide, with an orange-yellow colour. In fuming nitric acid it dissolves without any specially energetic reaction; but with glacial acetic acid the solution is faintly blue, which colour is also shown by the precipitate thrown down by water. Analyses of five samples purified in different ways and dried at 120° C. gave—

	I.	II.	III.	IV.	V.
C. . . .	65·15	65·26	65·29	65·75	65·92
H . . .	8·75	8·97	8·85	8·88	8·98

Samples IV. and V. were the most carefully prepared. The figures for carbon are about 1 per cent. lower than those found by Schnedermann.* Drying at 160° to 190° C., as recommended by Hlasiwetz,† is thought by the authors not to be advisable, as some of the water removed from a glucoside at this temperature would possibly be water of constitution.

β-Quinovin is in most respects very similar to α-quinovin, so that the characters already referred to the latter also apply to β-quinovin. Nevertheless, sharp distinctions between the two compounds are not wanting. The β-compound, unlike the other, is not soluble in absolute ether or acetic ether. From dilute alcohol it crystallizes readily in handsome scales. But its most characteristic difference from the α-compound is its behaviour towards absolute (98 per cent.) alcohol, in which β-quinovin is also freely soluble, with the liberation of heat, generally small in quantity, but easily recognizable with a thermometer. After some time, even if evaporation of the alcohol be prevented, a separation of crystals commences spontaneously. This phenomenon was most remarkable in a case where 100 grams of quinovin were dissolved in 420 grams of absolute alcohol. By the following day 118 grams of glassy crystals had separated, which exposed to air effloresced and lost weight until it reached 93 grams. In the 400 grams of alcoholic mother-liquor only 7 grams of quinovin remained dissolved. It appears therefore that the β-quinovin is reprecipitated from absolute alcohol, in which it is so soluble, almost completely in the form of an alcohol compound. The finest crystals are obtained when a solution of β-quinovin in twenty-five times its weight of absolute alcohol is allowed to evaporate slowly from a deep glass over sulphuric acid; but when removed from the liquid the crystals effloresce and become opaque with extraordinary rapidity. When heated in a melting-point tube these crystals melt in their crystallization alcohol between 70° and 80° C.; at 120 C., when the alcohol is all driven off, the substance again becomes solid, and it fuses like quinovin, under decomposition, at 250° C. Triturated with concentrated sulphuric acid on a watch glass β-quinovin forms a yellow solution, which exposed to air becomes a beautiful cherry-red; α-quinovin shows this reaction, but far more faintly. In rotatory power β-quinovin is the least active by one-half: $a = +27{\cdot}9$.

Decomposition of the Quinovins.—The decomposition into quinovic acid and sugar, first observed by Hlasiwetz, is shown by both α- and β-quinovin. It is effected by sulphuric acid as well as hydrochloric acid in alcoholic solution; but a solution containing 5 per cent. of sulphuric acid is not completely decomposed even after several hours' heating at 100° C. In the splitting up of small quantities (10 to 50 grams) for determining the yield of quinovic acid, it was found most advantageous to dissolve the quinovin in the smallest possible quantity of alcohol and allow the solution saturated with gas to stand in a closed vessel thirty hours. The decomposition was complete; all the quinovic acid had so completely separated as a heavy white crystalline powder that the small quantity of coloured supernatant liquid gave no precipitate with water. Quinovic acid may, however, be prepared direct from the brown resinous raw material, by dissolving it in alcohol and then heating it several hours upon a water-bath with much concentrated hydrochloric acid. The gelatinous quinovic acid which separates is white, notwithstanding the strongly coloured mother-liquor. It is washed with alcohol, in which it is insoluble, and then dissolved in it by the aid of ammonia. If the ammonia be boiled off, or hydrochloric acid be added with heat, the quinovic acid falls as a pure white sandy powder that can be easily filtered. The yield by this treatment equals about 60 per cent. of the raw material.

It was ascertained that both the quinovins yielded identical decomposition products and in almost the same proportions, the average yield of quinovic acid obtained from α-quinovin being 74·8 per cent., and from β-quinovin 77·2 per cent. The identity of the quinovic acid from the two compounds was determined not only by their general properties, but by the behaviour of their derivatives.

Quinovic Acid has been already pretty thoroughly described by Hlasiwetz. It forms a snow-white powder consisting of small needles, quite insoluble in water and soluble with great difficulty even in boiling alcohol or glacial acetic acid. It is best brought into solution by adding ammonia to the alcohol; after filtration it may be set free again by the addition of acetic acid.

Quinovic acid is soluble in ammonia, the alkalies and alkaline earths, though far less acid dissolves than would suffice for their saturation. The ammonia and lime salts

* *Annalen*, xlv., 277.
† *Annalen*, lxxix., 148.

crystallize from alcohol in needles, the former losing its ammonia in the air or by boiling its alcoholic solution. The alkaline carbonates are decomposed by quinovic acid. The alkaline solutions froth like a solution of soap.

If an alkaline solution of quinovic acid be precipitated by acids it separates in a gelatinous form, the entire contents of the vessel solidifying. In this condition, which probably represents a special hydrate of quinovic acid, the acid is remarkably soluble in ether and even in alcohol. The reaction can, therefore, be utilized in the recrystallization of the acid, which separates from ether in needles. Upon boiling or allowing the liquid to stand for some time, the acid passes from the soluble modification into the insoluble form. The authors did not find that quinovic acid possessed a regular melting point ; it softens at 295° C., giving off at the same time carbonic acid. Analyses of the substance dried at 120° C. gave the following results, I., II. and III. representing quinovic acid from α-quinovin and IV. and V. from β-quinovin :—

	I.	II.	III.	IV.	V.
C . . .	72·55	72·32	72·47	72·37	72·29
H . . .	9·26	9·24	9·47	9·86	9·34

These results vary slightly but constantly from those obtained by Hlasiwetz, who with a substance dried at 160° C. obtained in seven analyses an average of 73·60 per cent. of carbon and 9·85 per cent. of hydrogen, from which he calculated the formula $C_{21}H_{38}O_4$.

The authors failed to obtain salts of quinovic acid of sufficient purity to allow of their being used in estimating the equivalent of acid.

Quinovin Sugar.—In preparing the other decomposition product of quinovin, the quinovin sugar of Hlasiwetz, the alcoholic hydrochloric acid solution of quinovin is kept sheltered from air and light until nearly all the quinovic acid has separated (about twenty-four hours), then filtered, and the filtrate exactly neutralized with strong soda solution, and evaporated rapidly to dryness. The saline mass is boiled with absolute alcohol, the solution evaporated to dryness and the residue again taken up with a little absolute alcohol. The sugar is present then in the alcohol free from ash, but contaminated with a little quinovic acid, which may be precipitated from the concentrated alcoholic solution in flocks by boiling it with some water. The quinovin sugar is then filtered out and taken up once in absolute ether, in which it is remarkably soluble, and in this way it may be obtained containing only a little colour, which can be removed by animal charcoal. Quinovin sugar has a sweet taste with a bitter after-taste. Dried in a vacuum it resembles a colourless glass; it is highly hygroscopic, and could not be obtained in a crystalline form. At 105° C. it liquefied and gave off an odour of caramel. The following results were obtained upon analysis :—

	Found		Calculated for $C_6H_{12}O_4$	Calculated for $C_{12}H_{22}O_8$
C . .	48·98	48·90	48·65	48·98
H . .	8·12	8·18	8·10	7·49

The sugar from α- and β- quinovin was identical. It reduced Fehling's solution; but did not ferment with yeast, even after boiling with acid. It is dextro-rotatory ; the β- sugar giving $a = 78·1$

Decomposition Products of Quinovic Acid.—The authors report that they have succeeded in splitting up quinovic acid in two directions. When heated to about 300° C. under ordinary atmospheric pressure, or preferably to a lower temperature in a partial vacuum, carbonic acid is evolved leaving about 80 per cent. of a new acid (*pyroquinovic acid*), mixed with some resin, from which it can be freed by dissolving it in ether and shaking the ethereal solution with strong solution of potash, when the potash salt separates at once in white flocks of crystalline needles. Pyroquinovic acid melts, with previous softening at about 216° C., and distils unaltered at a temperature above 360° C. It is insoluble in acids, very difficultly soluble in petroleum spirit, but readily soluble in cold alcohol, ether, benzol, and glacial acetic acid, though an acetic compound separates, after a time from the last mentioned solution in clear crystalline plates. The alkaline solutions froth. *Novic acid*, the other decomposition product, is obtained when finely divided quinovic acid is dissolved in concentrated sulphuric acid. An active evolution of carbonic oxide takes place and when the reaction has ended the mass is thrown into water, the precipitate dried on porcelain and then dissolved in ether and the solution shaken with strong alkali solution. On standing the liquor separates into three layers, the middle one containing the potash salt of the new acid. The free acid crystallizes from benzol in colourless transparent needles, melting at 257° C. The top ethereal layer yields upon evaporation a yellow resinous mass, which can be crystallized from boiling alcohol in beautiful yellow needles. This substance, which gives several interesting colour reactions, has been named "chinochromin."

From the general results of the analyses the authors are inclined to represent these compounds by the following formulæ :—

Quinovin	$C_{38}H_{62}O_{11}$
Quinovin Alcohol Compound . .	$C_{38}H_{62}O_{11} + 5C_2H_6O$
Quinovic Acid	$C_{32}H_{48}O_6$
Pyroquinovic Acid	$C_{32}H_{48}O_4$

But some of the analytical results agree nearly as well with formulæ containing another atom of carbon, and at present the authors prefer to leave the question open.

THE SEPARATION OF MERCURIC FROM MERCUROUS IODIDE.*

BY H. MACLAGAN.

According to most authorities, the separation of these two salts is a very easy and simple matter, the process being to treat the powder with certain solvents, such as alcohol, ether, etc., which are supposed to dissolve out the red without action on the other.

I have lately had to perform some analytical work in this line, and was at first considerably puzzled at the singular results obtained. A sample of mercurous iodide, which was believed to be pure or nearly so, was washed with ether, sp. gr. 0·725, and the liquid, on evaporation, left a yellowish residue, which became red when rubbed. After several washings, the result was weighed, and amounted to about 1 per cent. The washings were then continued, using the same quantity of ether for each, and weighing after each evaporation, with the result of a *steady* and *uniform* increase until 6 per cent. was reached, when the washings were discontinued. The salt had become quite dark coloured, and metallic mercury was easily seen with the microscope. A quantitative analysis had shown that, making the usual allowance for loss, the iodide was pure, and this, added to the fact of the singular uniformity in the ratio of increase in weight of the deposit, and the fact that the total amount of red iodide obtained should have been soluble in one-tenth of the solvent used, pointed out clearly that it was being derived from the yellow iodide through some action of the ether. I have made a series of experiments to prove this, using different solvents of red iodide, and, as far as I have been able to ascertain, there is not a single one which does not more or less decompose mercurous iodide. Those experimented with were ether, sp. gr. 0·718; ether, sp. gr. 0·725 (Squibb's); ether, 0·725, and alcohol, 0·820, equal parts; alcohol, 0·820, and chloroform. In each case 1 gram of iodide was treated with six successive washings of 25 c.c. each of liquid, shaken occasionally at intervals of half an hour, and as much as could be poured off, filtered into a watch-glass and evaporated on the top of a drying oven, where the tem-

* From the *American Druggist*, May, 1884.

perature was about 120° F., the weight being noted after each evaporation. The results were as follows, the figures representing the weight in grams of the dry residue after evaporation of the solvent: —

	No. 1. Ether, 0·718.	No. 2. Ether, 0·725.	No. 3. Ether and alcohol.	No. 4. Alcohol, 0·820.	No. 5. Chloroform.
1st. .	0·0029	0·0044	0·014	0·0046	0·0007
2nd .	0·0029	0·0044	0·0118	0·0045	0·0007
3rd .	0·0026	0·0043	0·011	0·0044	0·0007
4th .	0·0034	0·005	0·0129	0·0031	0·0009
5th .	0·0028	0·0046	0·0105	0·0934	0·0009
6th .	0·0029	0·0049	0·0135	0·0042	0·0007
Total .	0·0175	0·0276	0·0737	0·0242	0·0046

The residues from Nos. 1, 2, and 5 were yellowish, but became red when rubbed, those from the rest were red. The iodide in Nos. 2 and 3 perceptibly darkened on the addition of the first 25 c.c., and at the end they were of a dirty greenish colour; the other three were only slightly discoloured. The residues on the glasses were then treated each with its original solvent to ascertain about the quantity necessary for solution.

No. 1 dissolved in 13 c.c., No. 2 in 10 c.c., No. 3 in 10 c.c., No. 4 in 6 c.c., No. 5 in 10 c.c. Thus showing that had the red existed primarily in the salt it should almost all have been obtained in the first washing. For additional proof of this 2 per cent. of red iodide was added to the same salt previously used, and one gram of the mixture treated with 25 c.c. of chloroform; the result was 0·0185, and a second 25 c.c. yielded 0·003. Next, 1 gram of iodide was shaken as before with 30 c.c. of ether, sp. gr. 0·725, the ether filtered into a second bottle containing 1 gram of iodide, and shaken from this into a third, then into a fourth, and, finally, into a watch-glass and evaporated (30 c.c. was used here, so as to have about 25 c.c. for the last gram). The deposit weighed 0·0049, the same as obtained previously from only 1 gram, and the salt in the first bottle darkened, while the other three were unchanged. One *decigram only* of iodide yielded by treatment with the same ether 0·0047, and the residual salt in the bottle was treated with a large quantity of ether, the dark coloured sediment collected on a filter and dried, a globule of mercury resulting.

The iodide used in these experiments was made by double decomposition of mercurous nitrate and potassium iodide, and fulfilled all the requirements of the U.S.P. An analysis of it showed

Hg	607	theory	Hg	611
I	386	requiring	I	389

Iodide made in the officinal way gave precisely similar results.

It seems clear from these facts that there is some principle in these solvents (probably the same in all, as they are closely related) which decomposes mercurous iodide, and, therefore, while sufficient for ordinary purposes in separating the two iodides, they cannot be used for analytical work without making proper allowance, and this allowance must probably be determined in each case. As indicated, chloroform is to be preferred, and of that, 25 c.c. will dissolve about 20 milligrams of mercuric iodide.

GINSENG CULTIVATION IN JAPAN.

The following particulars are taken from a United States official report on the method of cultivating ginseng, written by Yamaguchi Sheiguro, and forwarded by Minister Bingham, and translated by Mr. Whitney, interpreter, U. S. Legation:—

The seed of ginseng may be sown twice a year, namely, during the vernal and autumnal equinoxes; but in this district (village of Meiyama, county of Aidzu, province of Iwashiro, about 37° N. latitude, 140° E. longitude from Greenwich) the seed is usually sown during the autumnal equinox. The land on which the seed is to be sown is permitted to lie fallow for one year, and during the year following the grass is cut and buried in the soil for the purpose of fertilizing it.

In April of the same year the land is ploughed. Before the period called Taisho (commencing about the 22nd day of July) begins, horse manure and straw used in the stables are spread over the surface and the clods of earth are broken up, and the land is divided into mounds each about 3 feet broad for sowing purposes. By means of the *meita*—a board about 2 feet in length, 11-3 feet in breadth, in which is inserted a stick about ¼ foot long, sharpened at one end—the surface of the mounds is smoothed and the seed is sown in drills made with the *meita*. After sowing the surface of the mounds is lightly swept with a broom, and, in order to protect the surface from the sun, straw about 1 foot thick is spread over it. Before the period called Ko Kun (commencing about the 20th day of April of the ensuing year) begins the straw is removed, and on both sides of the mounds sticks about 5 feet long are erected about 6 feet apart, on which cross-bars are placed, over which straw mats are laid to protect the surface of the mounds from the sun, the sticks on the north side of the mounds being higher than those on the south. Until the period of Taisho (about the 22nd day of July) returns, the ground must be kept carefully weeded, and, during the first two years, the soil between the shoots of the ginseng must be hoed about seven or eight times, after which no weeding is required on account of the shoots being considerably grown.

When the period called So Ko (commencing about the 23rd day of October) begins the colour of the leaves becomes yellow, and the straw mats should then be removed. Twenty days after the period called Doyo, which begins about the 18th day of January and continues seventeen or eighteen days, the field should be manured. The quantity of manure for every tan (about ¼ acre) should be one *kan* and two hundred *me* (=7½ catties=10 pounds) of oil cake, 6 sho (1 sho=109·752 cubic inches, 'Hepburn's Dictionary') of rice bran, and a quantity of night soil diluted with water. The quantity of manure for every *tan* must be doubled in the second year and trebled in the third year. In July of the fourth year the roots are dug up and dried. Ginseng is, during its growth, attacked by the mole, the rat, and a worm about 2 inches long, called *hari-gane-mushi* (wire-worm), from its resemblance to a piece of wire. Of these the mole burrows in the field and overturns the roots of the ginseng, so that the plants finally die; the rat follows the holes made by the mole and eats the roots, consequently the latter is more injurious than the former. The following means are used to protect the plants against these pests:—

In order to prevent the mole from burrowing, boards about 1 foot square are inserted in the ground on all sides of the mounds so as to stop up the holes, or jars are buried here and there between the mounds, or pit-falls are made in the holes. In order to keep off the rat a bamboo tube filled with gunpowder is placed in the mole hole and the powder ignited, and the smoke remaining in the hole prevents the rat from approaching. In order to protect the roots from injury by the *hari-gane-mushi* (wire-worm), onions, leeks, or dai kon (a kind of large radish) are planted between the mounds about 1 foot from one another; and when the worms attack these vegetables, the vegetables are pulled up and the worms killed. These vegetables are planted for the purpose of attracting the worms.

The roots of ginseng having been dug up a portion of the stem about 3 inches long is cut off and the roots are washed in water with a brush.

Then the fibrous portion of the root about 1 inch long is removed—these fibres, called *moniku* (literally hair flesh), are used as a medicine, and the remaining parts

are scraped with a bamboo knife for the purpose of removing the particles of soil.

After these steps have been taken all the roots are classified into five species or grades, according to their qualities. Those roots which are large but injured are called Omare (literally large and rare), and those which are small and injured Sho mare (literally small and rare). The *moniku* or fibres are sometimes classified as the sixth and seventh species. All the roots are then put upside down into baskets made of bamboo, each containing about one *kammi* (8·33 pounds) in weight of the roots. The baskets are then placed for five minutes in a liquid specially prepared, and which is boiling.

In preparing the liquid the following steps are prescribed: 5 *momme* (=1-24 pound=2-3 ounce) of ginseng, manufactured in the preceding year. 25 *momme* of liquorice root, and 25 *momme* (3 1-3 ounces) of *shai-shin* (a drug) are thrown into (2) *to* and 5 sho, or 25 sho (about 10 gallons) of water, and when the colour of the water becomes brownish the residue of these substances is removed and 7 1-5 *go* (1 *go*=53·475 cubic inches) of alcohol is added to the liquid. The roots of the lowest quality of ginseng are first boiled in the mixture and then all the other species are successively boiled therein, from the lower to the higher qualities.

They are immediately dipped into cold water, and when entirely cooled they are dried.

After ten baskets of ginseng have been boiled the liquid should be changed. A place open to the sunlight is to be selected for drying the ginseng.

The process consists in setting up a shelf with a shade made of split bamboos. On the shelf the roots are dried. During the daytime the roots must be turned over six or seven times; at night they are kiln-dried.

After about three days the skin becomes tolerably dry, and the roots become pliable. The stems and fibres are then entirely removed and the crooked roots are straightened.

After this they are again dried for four or five days; if the weather be rainy they are kiln-dried. The whole process of preparation now being completed it remains only to put them in cases, first wrapping them in thick paper.

There are two or three other methods of cultivation, but they are mainly the same as the method described in this paper.

The quantity of seed required for planting one acre is about half a bushel.

THE USE OF NAPHTHALINE AS AN INSECTICIDE.*

Naphthaline, in one form or another, has for some time been used by entomologists as a means of preventing injury to their collections from acari, psoci, dermestes, anthreni, and other museum pests. My own experience is that it destroys the acari and psoci, but not the other pests, though it tends to repel them. Recent investigations would seem to indicate that it may be used to advantage in the field as an underground insecticide. It appears that as early as 1842 a French physician, Rossignon, pointed out the possible use of naphthaline not only as a remedial agency in medical practice, but also as a substitute for camphor for the destruction of museum pests. But up to the appearance of the grape phylloxera in France no serious experiments were made with it in the field. Among the substances tried against this pest naphthaline played its part. The efficient ingredient in the "poudre insectivore" of Peyrat, was, according to Maurice Girard, naphthaline; but the experiments with it did not yield encouraging results.

Baudet recommended it to the French Academy in 1872, while in 1874 E. Fallieres proposed gypsum saturated with naphthaline, the mixture to be distributed over the soil. It was also among the numerous substances experimented with by Messrs. Maxime Cornu and P. Mouillefert, the results of which were published in the well-known memoir presented by these gentlemen to the French Academy in 1877. Naphthaline, up to this time, proved to be of little value in killing the insect, and of no value as a repellant. Nevertheless, Dr. Ernst Fischer, of the Strassburg University, encouraged and induced by the most favourable results obtained with naphthaline as an antiseptic and as a destroyer of micro-organisms (moulds, schizomycetes, bacteria, etc.), has, since 1881, again experimented with it as a direct remedy for the phylloxera; and he has given us the results of his experience in an interesting *brochure* lately received. The first part of Dr. Fischer's work treats of, and strongly recommends, the use of naphthaline for surgical purposes as an antiseptic superior, in most respects, to all other antiseptics now in use. His conclusions are based on extensive experiments showing the effect of the material on the lower organisms, and prove that, properly used, it not only arrests the growth of these micro-organisms but eventually destroys them. This part of the work will be of especial interest to those who are experimenting with a view of destroying disease-germs. It is to the second part that I would here call attention. Preliminary to a statement of the results of this part of Dr. Fischer's work, a few facts in regard to the nature of the substance may not be out of place.

Naphthaline, a carbohydrate of the formula $C_{10}H_3$, was first made in 1820, by Garden, from coal tar. It is volatile at any temperature, melts at 79·2° C., boils at about 214° C., and has a specific gravity of about 1·1. Essentially insoluble in water, alkalies and diluted acids, it is easily soluble in ether, hot alcohol, hot concentrated sulphuric acid and in many volatile and rich oils. It is readily carried off with aqueous vapours, so that in order to quickly disinfect a room, it is only necessary to heat a vessel with water in which naphthaline has been put. The naphthaline gas mixes very readily with atmospheric air, and is also readily taken up by water. It is not poisonous to man or to the higher animals, and for surgical purposes should be used chemically pure. The crude material is by far cheaper, and upon inquiry Dr. Fischer found that in London it can be obtained, without barrels, at 25 marks (6 dollars) per 1000 kilograms (about 2200 pounds), in Paris at 100 francs, and] in Cologne at about 45 marks (barrels included). The crude naphthaline contains more or less phenol and creasote, and is a stronger insecticide than the purified article, but also more injurious to plants. Dr. Fischer used the purified naphthaline in his experiments on phylloxera, but thinks that with some precaution the crude material might safely be used, especially if it is not brought in direct contact with the plant, or if used in the dormant season.

The experiments with phylloxerized grape vines were carried on under direction of Dr. Fischer at La Grave d'Ambares, near Bordeaux. Fifteen badly infested stocks,* partly growing on light, partly on heavy soil, were treated in April, 1883.

It was placed in a hole dug in the ground near the main root, and subsequently covered up; and the quantity used was on some plants one, and on others one-half kilogram. On September 18, the plants were examined with the following result:—All plants experimented with, but especially those treated with the largest quantity of naphthaline, showed a new and healthy growth of numerous long, fine rootlets, which were perfectly free from phylloxera; in fact, the phylloxera had entirely disappeared from the roots of all plants experimented with, whereas several plants not treated with naphtha-

* 'Das Naphtalin in der Heilkunde und in der Landwirthschaft.' Von Dr. Med. Ernst Fischer. Strassburg: Trubner, 1883. Reprinted from the *Oil, Paint, and Drug Reporter*, May 14, 1884.

* It is not stated whether the roots of these stocks were examined at the time, to ascertain whether or not the phylloxera was still at work.

line showed no young growth of rootlets, and an abundance of phylloxera. The growth above ground of the plants treated showed no difference as compared with plants not treated—a fact explained by insufficient time for the treated plants to recuperate. Some of the most vigorous new rootlets were found to have penetrated the layer of naphthaline, thus showing that the latter has no injurious influence upon them. A considerable quantity of the naphthaline was found unchanged at the date of examination, which shows that the evaporation is very slow, and that its effects will be correspondingly lasting.

The results are certified to by official affidavits, and were more marked on plants growing in heavier and moister ground than on those in light and gravelly soil.

As the most convenient mode of application, Dr. Fischer recommends that about 1 kilogram of the naphthaline be put in a trench dug around the plant a few inches from the stock; the trench to be not less than from 15 to 20 centimetres deep, and to be at once filled up again. He attributes the failure of former experiments: 1. To the small quantity of the material employed. 2. To its being employed too near the surface of ground, so as to permit evaporation in the air. He also thinks that results were expected after too short a lapse of time.

OLEUM GAULTHERIÆ.*

BY ISAAC EDWARD LEONARD, PH.G.

Oil of wintergreen was first made in Luzerne county, Pa., in 1863, from which time it has been distilled in great quantities, with the exception of last year, when the yield was not so plentiful, owing to the destruction of the shrubberies by the fire which passed over our mountains.

In distilling, the entire overground portion of the plant is employed, which has its greatest yield during the months of July and August.

The still is generally a wooden box, about eight feet long, four feet wide, four feet high, with a copper bottom and staid with bolts. The head of the still is copper, and connecting with this is a square or circular worm of the same material or of tin, placed in a barrel. The still being filled with wintergreen to within about twelve inches of the top, a sufficient quantity of water is added, and this is allowed to macerate from ten to twelve hours. The fire being started, the distillation commences and continues for about eight hours; but during the first two or three hours, 90 per cent. of the oil has passed over. For collecting the distillate, most of the distillers use a wide mouth bottle or fruit jar, fitted with a large cork having two holes. A small tin or glass funnel is put into one of the holes, so that the beak of the funnel is below the shoulder of the receiving vessel, and connected with the other hole is a suitable pipe forming an egress. The distillate passes into the receiving vessel through the funnel. It is here that the oil and the water separate, the oil going to the bottom, and the water being lighter and in excess passes through the egress pipe into a larger receptacle, where it is reserved for a subsequent operation (cohobation).

Occasionally the oil is very highly coloured. I have found several samples to contain traces of iron, which is due to the oxidation of the tin worm or can with which the oil comes in contact. Tin worms are used on account of their cheapness, but will only last about two weeks, before they undergo oxidation.

The wholesale dealers that handle the oil in large quantities have three ways of "cleaning" it, re-distillation, filtration and decolorization. The first two processes are easily understood, while the decolorization seems a difficult one, but is much easier than either of the others. The oil to be decolorized is put into a bottle and crystals of citric acid are added, the whole allowed to stand, agitating occasionally, until the oil is colourless, or nearly so.

On experimenting with nine quarts of wintergreen fruit, I found it contained one and a half drachms of oil. The chief uses of the oil are for flavouring and in printing fine calicoes.

In experimental distillation, I found that the lower specific gravity is due to the separating of the oil from the water too quickly, and that the higher specific gravity is obtained by letting the distillate stand from twenty-four to forty-eight hours before separating the oil from the water.

A case of poisoning occurred in 1883, at one of the grocery stores in White Haven, Pa. A man mistaking the oil for the milky water, drank about two ounces; he was taken to his home in Easton, Pa., and died in about five hours.

Parties have tried to export the oil, but did not succeed.

From the *American Journal of Pharmacy*, May, 1884.

WEST INDIAN EPIPHYTES.

A. F. W. Schimper describes, in great detail, in the *Botanisches Centralblatt*, the various epiphytes natives of the West Indies. They belong to a great variety of families. Of species the largest number belong to the Orchideæ, but in the mass of individuals, to the Bromeliacæ and Aroideæ; next follow the Filices, Rubiaceæ, Gesneraceæ, Ericaceæ, Cactaceæ, Myrsineæ, Melastomaceæ, Bignoniaceæ, Clusiaceæ, Piperaceæ, Urticaceæ, and Cyclantheæ. They are usually herbaceous, but very often of considerable dimensions, less often woody.

The subject is treated under three heads, viz.:—(1.) General remarks on the epiphytic flora of the West Indies. (2.) The structure of the different species. (3.) The influence of their mode of life on their geographical distribution.

As far as regards their mode of life, they may be classified into four groups, viz.:—(1.) Those in which the adaptations are very simple; deriving their nourishment entirely from the *detritus* of the bark to which they are fixed. (2.) Those that derive their nourishment through aerial roots which reach the ground. (3.) Those in which the roots form a conspicuous spongy mass, in which great quantities of moisture and humus are collected; and (4.) Those in which the leaves perform the ordinary functions of roots in absorbing water and nutrient salts.

The special contrivances in particular cases are described in detail.

KOUSSINATE OF SODA.*

One of the most efficient combinations of koussin is that with soda, which is effected as follows:—Any desirable quantity of koussin is dissolved in hot water, to which enough bicarbonate of soda is added to dissolve the koussin entirely; boil this solution with a little animal charcoal for a few seconds and then filter. The solution thus obtained, and which though slightly coloured is clear, is now slowly evaporated in a porcelain dish until dry. The koussinate of soda is an amorphous, powder-like mass, of intensely bitter taste and a whitish colour, slightly bordering on yellow, somewhat hygroscopic, soluble in cold water, but more so in warm. It is equally soluble in alcohol, excepting the slight superabundance of carbonate of soda. On account of this great solubility it can be dispensed in all forms, and it is said to have done splendid service in the treatment of tenia and pin worms.

* From the *St. Louis Druggist*. Reprinted from the *Pharmaceutical Record* May 15, 1884.

The Pharmaceutical Journal.

SATURDAY, JUNE 7, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

DR. J. BURDON SANDERSON ON INFECTION AND DISINFECTION.

NOTWITHSTANDING the multitudinous treatises that have been devoted to the subject of disinfection, each successive investigation seems to widen the field of research rather than to deal exhaustively and finally with any particular portion of it. Still some advance has been made, and a tendency is now evident to go beyond what Mr. SIMON calls "vague chemical libations and powderings" and to deal definitely with the specific organisms which are associated with different forms of contagious disease. Hitherto, attention has been mainly directed to the rendering of solid and liquid excreta innocuous, but in a memorandum appended to the Report of the Medical Officer to the Local Government Board that has been just issued, Dr. J. BURDON SANDERSON urges that this is not by any means all that can be accomplished by the application of chemical agents for the prevention of infective diseases. He points out that the innate no less than the extraneous contagia have a life history which is made up of two states of existence, alternating with or succeeding each other,—one in which they vegetate with more or less activity in the external environment, the other in which they have their abode in living blood or tissue, exerting there their hurtful function,—and that the problem of disinfection relates to the latter as well as to the former of these states. In the application of disinfectants, the attainment of one or both of two practical purposes may be kept in view: the direct action of the disinfectant on contagia so as to render them innocuous, or the arrest and inhibition of their morbific action within the body. Dr. SANDERSON considers that the most important lesson that has been learnt in recent researches respecting the nature of contagia is best expressed in the word "specificity," by which he means that each individual kind of contagium has a power peculiar to itself of producing a particular modification of the chemical processes which constitute the life of the organism it attacks. Very little is yet known respecting the effect of chemical agents upon the progress of such modifications within the organism, and before much extension of this knowledge can be hoped for not only will a more intimate acquaintance with the contagia be indispensable, but the nature of the modification produced by each will require to be worked out. Holding these views, therefore, Dr. SANDERSON indicates four lines of research which should be followed with a view of acquiring a better and more practical knowledge of the art of disinfection: (1) the disinfection of liquid and solid excreta and of clothing; (2) the disinfection of air; (3) the detection of contagia in food, air, or water; and (4) the use of colytic agents with a view to the inhibition of infective action within the living body. Postponing for the present a discussion of the first two divisions, he deals in the memorandum with the last two in some detail.

In attempting to determine the presence or absence of morbific germs in water or air the method of cultivation is the best available; but here we are met by a difficulty due to the universal presence of microphytes. Some assistance may be rendered by the analyst, but his results, as ordinarily obtained, do not help to discriminate between the living and non-living, much less between active and inert, between hurtful and innocuous. Dr. SANDERSON, therefore, argues that in the examination of water for the purposes of public health it is desirable to add to the approved methods of qualitative analysis a much more complete and systematic examination of its biological properties, which should have a point of departure in the qualitative sorting of the microphytes of contagium and aim at acquiring knowledge as to the morphological development of each species, as well as its external chemical relations with its environment.

In discussing the possibility of inhibiting the action of contagia after they have entered the human or animal organism, Dr. SANDERSON remarks that the knowledge we at present possess to assist us in attacking this part of the problem amounts to little more than that all contagia owe their power to their continued chemical action on the living substance of the organism they attack. In this and other points specific contagia resemble the common septic ferments, but they present marked points of difference. For instance, the symptoms of septic infection follow immediately on invasion of the septic poison and as rapidly subside, whilst the specific poison has a definite period of incubation and retains its hold upon the organism for a period equally definite, whilst both these periods, as well the pathological disturbance produced, are in general characteristic of the particular species. Agents antagonistic to septic infection before, as well as after, its entry into the organism are known, though little is understood as to the way in which they act, and the question arises whether similar agencies may not be discovered in relation to specific contagia. Dr. SANDERSON believes, for reasons given, that "all "contagious microphytes are related by descent to "the common microphyte of sepsis, and consequently "that whatever properties belong to the parent are "likely to be represented, more or less modified, in

"those of the successors." Assuming, therefore, that the agent by which the septic microphyte produces its toxic effect is a ferment in the chemical sense, it might follow that the morbific action of the microphyte of small-pox is of the same nature; so that if it can be shown that septic fermentation is brought to a standstill by the development of an antagonistic chemical action, it seems possible that the mechanism by which the variolous fermentation is terminated is similar and within the reach of investigation. Recent researches have indeed shown that the development of microphytes in an albuminous fluid undergoing sepsis at a favourable temperature is a terminable process and that the period of the most active vegetation is coincident with the greatest toxical activity of the liquid. After this culmination the organisms cease to multiply, and eventually die, long before the nutritive material has been exhausted. This is regarded as the result of the interference of compounds resulting from the breaking up of the proteid molecules, which have been ascertained to belong to the aromatic group, and to be represented at an early stage in the septic process by acids of the acetic series, in which an atom of hydrogen is replaced by an aromatic molecule. One of these compounds so developed, phenyl-propionic acid, has been found by experiment to be more than twenty times as destructive of the vitality of microphytes as carbolic acid, and, therefore, one of the most powerful antiseptics known. Physiologists have long been familiar with the fact that chemical bodies of the aromatic group take part in the normal exchange of the material of the living body. It would seem, therefore, that no unimportant portion of the sanitary problem will be how best to maintain their presence in such relation to the body as to furnish it with the means of struggling against hostile agencies.

APOTHECARIES AND THE MEDICAL BILL.

In a recent editorial article in the *Medical Times*, *à propos* of the attitude taken by the Society of Apothecaries towards the Medical Bill now before Parliament, some views are put forward that recall a suggestion made a few years since by the first President of the Medical Defence Association, as to a method for settling satisfactorily what he termed "the counter practice controversy." Our contemporary is strongly adverse to the amendment of the Bill so as to maintain the Society of Apothecaries in the anomalous position it has so long held; but it professes to see a great future for that body if the rulers of it will only accommodate their course to the necessities of the time. It is of opinion that should the Medical Bill pass without any tangible modification, there would be a great likelihood that before the law has been in operation many years an irresistible demand would arise for a lower grade of medical practitioners, who would not think it beneath their dignity to accept the only fees that the labouring classes can afford to pay. Medical men, it says, are even now above the position which many of them have to take, so that there is a danger that when the law demands a still more prolonged and costly education, the poorer sick "will be entirely deserted by the doctors and left to the tender and ignorant mercies of the herbalist and prescribing chemist." When this crisis arrives, it is predicted, the public will demand that chemists shall receive some smattering of medical education, and be allowed to visit patients and treat them, or else that a lower grade of medical practitioners shall be created for the service of the poor. Already it is pointed out the State has recognized this principle of a lower grade of practitioners in the institution of the Dentists' Register.

In this emergency, according to our contemporary, the Government will naturally turn to the Society of Apothecaries, or the Pharmaceutical Society, as the proper authority for controlling the new departure. Or, adopting a suggestion made recently by a writer in *Blackwood's Magazine*, the two societies might form an alliance for the examination and authorization of low priced practitioners, in which case, it is thought, the Society of Apothecaries would have a fair claim to control the examinations. That Society is, therefore, recommended to give up its hopeless attempt at rivalry with the Colleges of Surgeons and Physicians and be content to take a lower place, the recompense suggested being the opening up of a useful and lucrative *rôle* for it in the not far distant future.

We have thus briefly paraphrased the principal points in the article in the *Medical Times*, rather because it may interest our readers to become acquainted with the views advocated seriously by so respected a contemporary than because we think they are likely at present to be included within the range of practical politics. It is not, indeed, for us to say whether the Society of Apothecaries will be tempted by the prospect of a "useful and lucrative *rôle*" to ignore its ambitious past, "get over the old idea . . . that a doctor must of necessity be a gentleman," and busy itself in opening up a "very useful and excellent career . . . for many of the picked pupils of the Board Schools." Nevertheless, we think such a course very unlikely to be adopted. But we believe our contemporary evinces profound ignorance of the sentiments of the chemists and druggists in this country as a body to suppose that they would voluntarily enter into any alliance which would place their examinations or any part of their proceedings to any extent under the control of a medical corporation. Such a proposition requires only to be mentioned to be stigmatized at once as likely to be fertile in misunderstanding and mischief. Moreover, we are convinced that such an alliance would be inimical to the best interests of pharmacy, if not of medicine. The scientific practice of pharmacy has a future of its own in this country and will be best

able to serve medicine whilst carried on independently of it. We have the past history of the Society of Apothecaries to show the effect of attempting to combine in one person the compounder of drugs and a low grade of medical practitioners. Naturally, this hybridism resulted in an undue predominence of what was assumed to be the higher—and probably was the most remunerative—strain in it, and the word "apothecary" acquired a new and non-natural meaning in the English language. We do not fear, therefore, that the Pharmaceutical Society of Great Britain will risk a repetition of this experience, and by taking a similar course promote a return to the dark ages of pharmacy in Great Britain, or be tempted under any such pretext to endanger the advance in pharmaceutical science which it has done so much during the last forty years to promote.

The Medical Acts Amendment Bill was the third order of the day in the evening sitting of the House of Commons on Friday, but at the time of going to press this stage had not been reached.

* * *

After six years' agitation the New York State Pharmaceutical Association has secured fresh legislation regulating the practice of pharmacy in all the counties of the State, except New York, Erie and Kings. The new Act practically places the duty of carrying out the examination, registration and supervision in the hands of a Board of Pharmacy, consisting of five members, who are to be selected by the Governor of the State from ten pharmacists nominated by the State Pharmaceutical Association. The Board will hold office for five years, the Governor selecting from nominees once a year the number of pharmacists requisite to fill up any vacancies that may occur.

* * *

The pharmacists of New York City, however, appear to have been less successful in an attempt to carry through the Legislature a Bill to confine the sale of drugs and patent medicines in the city to pharmacists. The Bill is said to have been defeated mainly through the influence of the patent medicine manufacturers, who through their counsel urged upon the Committee which had it under consideration that there is no responsibility attending the sale of patent medicines, and that many of them "possess no merit whatever" and could do no injury to the public!

* * *

At a recent meeting of the Paris Société de Pharmacie the subject of an International Pharmacopœia was broached by M. Petit, who suggested the advisability of having the draft already drawn up by the Society printed, and of remitting the consideration of the subject to a new Commission, the powers of the former one having expired. M. Ferrand objected that the impression produced upon him respecting this question whilst attending the International Pharmaceutical Congress in London was unfavourable to the initiative being taken by France, and M. Desnoix expressed an opinion that it would be better to await the decisions at the coming International Congress in Brussels before taking any further steps. After some further discussion it was decided that the manuscript should be communicated to the Brussels Congress.

* * *

Some of the friends and admirers of Dr. A. W. Hofmann in the United States, wishing to testify their appreciation of the services he has rendered to the world by his labours in chemical science and of commemorating his recent visit to that country, have subscribed to have a gold medal struck at the United States Mint in Philadelphia, and this has been forwarded with a complimentary letter to the learned Professor in Berlin. In acknowledging the receipt of the present, Dr. Hofmann, whilst modestly protesting that he has rendered no service which deserves such commemoration, and confessing that he is "somewhat perplexed by the monumental form" which the good feeling of his American friends has taken, expresses himself as deeply touched and feeling highly honoured by the solid and permanent token of their sympathy.

* * *

The Royal Society of New South Wales, with a view of encouraging original research, has published an offer to present a medal and a money prize of £25 for the best communication upon each of eight subjects which are arranged in three series. Among these subjects may be mentioned the "Influence of the Australian Climate in producing Modifications of Disease," to be sent in to the Honorary Secretaries, Sydney, not later than September 30, 1884; "The Chemical Composition of the Products from the so-called Kerosene Shale of New South Wales," to be sent in not later than May 1, 1885; and "The Chemistry of the Australian Gums and Resins," to be sent in not later than May 1, 1886. The competition is to be an open one and will not be confined to residents in the colony. A communication to be successful must be either wholly or in part the result of original observation or research on the part of the contributor, as no award will be made for a mere compilation, however meritorious.

* * *

We have received from Mr. J. E. Ryder, of Great Portland Street, a letter of warning that the "chloroform dipsomaniac" who a few years ago caused a considerable amount of annoyance and anxiety to several West-end pharmacists, by obtaining, under the pretence that he was a medical man a supply of chloroform and drinking it in the shop, has recommenced his mischievous operations. The man may be easily recognized by the fact that, apparently in consequence of some defect, he carries one arm folded across the chest.

* * *

A meeting of the London Section of the Society of Chemical Industry will be held in the Chemical Society's Rooms, Burlington House, on Monday next, at 8 p.m., when Mr. W. S. Squire will read a paper on "The Processes concerned in the Conversion of Starch into Alcohol, and their relation to Brewing and Distilling."

* * *

A meeting of the School of Pharmacy Students Association will be held on Thursday, June 12, at 8 p.m., when a paper will be read by the Honorary Secretary (Mr. Wyndham Dunstan), on "The Separation of Chlorides, Bromides and Iodides," and a Report on Practical Pharmacy will be made by Mr. R. A. Cripps.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, June 4, 1884.

Present—Messrs. Andrews, Atkins, Borland, Bottle, Butt, Carteighe, Churchill, Gostling, Greenish, Hills, Radley, Richardson, Robbins, Savage, Squire, Symes, Williams and Young.

The chair having been taken by Mr. Michael Carteighe, the minutes of the meetings of May 7 and 21 were read and confirmed.

The late Mr. Squire.

Mr. Carteighe read a letter from Mrs. Squire thanking the Council for the resolution passed at the last meeting.

Election of President.

A ballot having been taken in the usual way—

MR.. MICHAEL CARTEIGHE

was unanimously re-elected President for the ensuing year.

The President said he was extremely grateful to his fellow Councillors for this mark of their confidence. It was a source of satisfaction to find that his efforts in behalf of the Society had received their cordial sympathy and support. He could only say that whatever he had been able to do for the Society and the Council was largely due to the loyal support he received from every one of his colleagues.

Election of Vice-President.

On a ballot being taken—

MR. SAMUEL RALPH ATKINS

was re-elected Vice-President for the ensuing year.

The Vice-President expressed his acknowledgments for the honour conferred on him, and thanked his colleagues for the courtesy and sympathy which had been shown him during his previous terms of office. He said he would endeavour to devote the same amount of attention to the Society as he had done in the past.

Election of the Treasurer.

On a ballot being taken—

MR. JOHN ROBBINS

was also re-elected Treasurer for the ensuing year.

The Treasurer, in thanking the Council for the honour again conferred upon him, said that by the wise decision of the Council to re-invest its funds and securities with more advantage, the Treasurer during the past year had had to draw larger sums of money than any of his predecessors, and in the forthcoming year he would probably have to draw larger sums than would fall to the lot of any of his successors. As he had always taken an interest in the line of policy adopted he felt great satisfaction that it was being carried out during his term of office.

Standing Orders.

The Standing Orders of the Council were unanimously adopted for the ensuing year.

Letter of Resignation from Mr. Hampson.

The President read the following letter which he had received from Mr. Hampson:—

"205, St. John Street Road, E.C.,
"*June 2nd*, 1884.

"Dear Mr. President,—With feelings of regret I beg to resign my seat at the Council of the Pharmaceutical Society.

"In consequence of the continued illness of my wife and my own imperfect health, it is necessary that I should relieve myself of all unimperative duties, so that I may be able to obtain more leisure.

"My interest in pharmaceutical progress and in the welfare of the Pharmaceutical Society is unabated, and, perhaps, I may at some future time have opportunities of giving effect to this feeling.

"Kindly convey to the Members of the Council the assurance of my most friendly regard.

"I am, dear Mr. President,
"Yours sincerely,
"Robt. Hampson."

The Council went into committee to consider the letter, and the following resolution was passed unanimously on the motion of the President:—

"That Mr. Hampson's letter be received and entered on the minutes; that the Council, having in view the able services so long rendered to the Society, hesitates to accept his resignation, and instructs the Secretary to write to him requesting him to reconsider his determination."

Election of Secretary.

The President read the following letter from Mr. Elias Bremridge:—

"New Malden, Surrey,
"*May* 31*st*, 1884.

"My dear Mr. President,—In preparing the Agenda for the June Council Meeting, when the appointment of officers for the ensuing year will be considered, I have been reminded of the pleasure it has always afforded me on similar occasions to find that I continued to possess the confidence of the Council, as shown by my being unanimously re-elected. This has occurred year after year for a period of nearly twenty-eight years, and during the whole of that time it has been my privilege and my happiness to enjoy, I believe, the personal friendship of every member of the Council.

"I feel, however, that the time has at length arrived when it is desirable, and perhaps opportune, that I should request the Council to release me from my official duties as soon as may be found convenient.

"The growing necessity for this step has been on my mind for some time past, but it has required no small effort to screw myself up to make this communication and to ask you, my dear Sir, to make this announcement of my views to the Council at its next meeting.

"The reason that has had the most weight with me in coming to this conclusion is that my sense of hearing has become imperfect, and I find it is getting increasingly defective, so that, although the Council and the Committees have generously borne with this infirmity, the knowledge that I could only imperfectly perform my duties has, at times, been a source of depression and grief to me; moreover, I have recently had strong indications that I no longer possess my former elasticity and endurance.

"Under all these circumstances I could not conscientiously desire to retain my official position. But I shall continue to watch the proceedings of the Council with unabated interest, and I shall ever remember, with grateful feelings, the many happy years during which I have had the distinguished honour of carrying out its instructions and the important duties ordinarily devolving on the Secretary and Registrar.

"I beg to remain,
"My dear Mr. President,
"Ever faithfully yours,
"Elias Bremridge."

The President said this letter would be received with a general feeling of regret, but coupled with that the members of Council must entertain considerable respect for the courage which an old and valued officer showed by sending in his resignation when he felt he could no longer do the work as efficiently as he did in days gone by. He thought this was not the proper time to refer to Mr. Bremridge's great services and devotion to the Society. He should ask the Council to formally refer the letter to the Library Committee for consideration

and report as to the best mode of dealing with it and filling up the vacant office, and the members of Council would have an opportunity of expressing their sentiments when the report came up.

The VICE-PRESIDENT seconded the motion, which was carried unanimously.

Mr. ELIAS BREMRIDGE was then unanimously appointed Secretary and Registrar until further notice.

ASSISTANT SECRETARY AND DEPUTY REGISTRAR.

Mr. RICHARD BREMRIDGE was also unanimously appointed Assistant Secretary and Deputy Registrar until further notice.

APPOINTMENT OF AN EXAMINER.

The PRESIDENT said the next business was to appoint an Examiner for England and Wales, in place of Mr. H. B. Brady, F.R.S., who had resigned.

The Council went into committee to discuss the merits of several gentlemen whose names were mentioned.

On resuming—

MR. W. H. SYMONS, of 2, Queen's Terrace, St. John's Wood,

was appointed, subject to the approval of the Privy Council.

APPOINTMENT OF EDITOR AND SUB-EDITOR OF THE JOURNAL.

Dr. B. H. PAUL was appointed Editor, and Mr. F. PASSMORE Sub-Editor of the Society's Journal for the ensuing year.

APPOINTMENT OF CURATOR.

Mr. E. M. HOLMES was appointed Curator for the ensuing year.

TREASURER TO THE SOCIETY IN SCOTLAND.

Mr. JOHN B. STEPHENSON was unanimously re-elected Treasurer to the Society in Scotland.

SECRETARY TO THE SOCIETY IN SCOTLAND.

Mr. PETER MACEWAN was re-appointed Secretary to the Society in Scotland.

RESTORATIONS TO THE REGISTER.

The names of the following persons, who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Benjamin Henley Eastes, Loughton, Essex.
William Pierpoint Lawrence, 194, Great College Street, Camden Town, N.W.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemist.

William Pierpoint Lawrence, of London, a Pharmaceutical Chemist, having tendered his subscription for the current year, was elected a "Member" of the Society.

Chemist and Druggist.

Adam McGregor, of Ayr, who was registered as having been in business on his own account before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Bartle, William Frederick .....Greenwich.
Burchell, Robert Henry .....Kettering.
Oldershaw, George .....Liverpool.

ASSOCIATES.

The following, having passed their respective examinations and tendered (or paid as "Apprentices or Students") their subscriptions for the current year, were elected "Associates" of the Society:—

John, Benjamin .....Narberth.
Moss, Thomas Abbot .....Carlisle.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Acton, Frederick George .....Worcester.
Allin, Charles James .....St. Albans.
Barclay, John .....Birmingham.
Evans, John Richard .....Dowlais.
Farquharson, Alexr. McDonald.Aberdeen.
Flower, Walter.....Barton-on-Humber.
Hitchman, Walter .....Kettering.
Jaques, George.....Leeds.
Jarvis, James Henry .....Hastings.
Jones, Ebenezer Owen .....Swansea.
Lewis, Daniel .....Tredegar.
Menhinick, Chas. Hy. Foott ...Stonehouse.
Mould, Arthur H. .. ..London.
Owen, Alfred Ernest .....Newcastle.
Pearson, Ernest .....Cromford.
Puckey, William .....Bishops Stortford.
Smith, Henry .....Durham.
Tomkins, William Kingston ...Oxford.
Wisker, Robert Hardy .....York.
Withers, Herbert Percival.....Penwortham.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

LOCAL SECRETARIES.

The nomination of Local Secretaries for the ensuing year was deferred to next month, in order that the list might be considered by the Library, Museum and Laboratory Committee. The following return was laid on the table by the Secretary:—

No. of towns eligible, 1883-4.	305
No. of towns from which votes have been received	195
No. of towns from which no votes have been received	111
No. of towns added to the list as eligible (Accrington, Helensburgh, Maidenhead, Ruthin)	4
No. of towns removed from the list as not eligible (Exmouth, Redditch, Slough) .	3
No. of towns eligible, 1884-85	306

ADDITIONS TO THE REGISTER.

The Registrar reported that—

Francois Hippolyte Rebaute, of 26, Rue St. Gilles Paris; and
Richard Richardson, of Williamstown, near Melbourne, Australia,

having made statutory declarations that they were in business before the passing of the Pharmacy Act, 1868, and these declarations having been duly supported by qualified persons, their names had been placed on the Register.

An appeal against the Registrar's decision which had been made by a person who claimed to be registered was submitted to the Council and referred to the General Purposes Committee.

APPOINTMENT OF COMMITTEES.

The following gentlemen were appointed on the various committees for the ensuing year:—

General Purposes.—The whole Council. To meet at six o'clock on the evening previous to the Council meeting.

Finance.—Messrs. Gostling, Hills, Radley, Savage

Schacht, Symes and Woolley. To meet at four o'clock on the day previous to the Council meeting.

Library, Museum, Laboratory and House. — Messrs. Andrews, Bottle, Butt, Greenish, Hills, Robbins, Schacht and Squire. To meet on the second Wednesday in the month at eleven o'clock, except in August and September.

Benevolent Fund.—Messrs. Andrews, Borland, Bottle, Butt, Churchill, Greenish, Richardson, Robbins, Squire, Williams and Young. To meet at half-past three on the day preceding the Council meeting.

Law and Parliamentary. — Messrs. Bottle, Butt, Greenish, Hills, Richardson, Robbins, Squire, Symes, Woolley and Young. To meet as occasion may require.

Evening Meetings.—The Professors, the Editor and the Curator. To meet when required.

Freehold Investments.—The President, the Vice-President, the Treasurer, and Mr. Butt. To meet as occasion may require.

Revision of Bye-laws Committee.—Messrs. Bottle, Butt, Hills, Robbins, Schacht, Symes, Woolley and Young.

Spurious and Worthless Drugs. — Messrs. Greenish, Richardson, Symes, Williams, Woolley and Young; with Mr. Fred Barron, Mr. Richard B. Barron, Professor Bentley, Mr. Thomas Farries, Mr. G. Bult Francis, Mr. J. B. Herring, Mr. A. B. Hill, Mr. W. Hodgkinson, Mr. Holmes, Mr. E. Horner, Dr. Paul, Mr. Umney, and Mr. F. Yates, with power to add to their number. To meet when required.

The President and Vice-President are *ex officio* members of all committees.

Some conversation took place with reference to the appointment of the Committee on Spurious and Worthless Drugs.

Mr. Williams remarked on the fact of a large quantity of spurious cubebs having been recently offered for sale.

Mr. Greenish referred to another case which had been mentioned in which nux vomica seeds had been mixed with ginger.

Mr. Williams said he understood the Committee had held no meetings during the past year.

The President said the object with which the Committee was originally appointed was to have a body representing both the Society and the wholesale houses, who would take notice of these matters. If anyone brought any special case under his notice he would call the Committee together at once. Part of the object no doubt was to consider any proposed legislation on the subject. It would not be wise to meddle too much with commercial affairs in the city.

Mr. Greenish suggested that it would be a very good thing if a record were kept of cases of adulteration which were discovered, and tabulated. Such information would be very valuable in case any legislation were contemplated.

The President said this suggestion was worthy of consideration, and he would bear it in mind.

FINANCE.

Messrs. Carteighe, Atkins, Gostling, Hills and Savage, acting as an interim Finance Committee, had examined the accounts, and recommended certain accounts for payment. Their report and recommendations were received and adopted. These included the expenses of the Conversazione.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Library.

The report of the Librarian had been received, including the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
April	Day	458	29	9	20
	Evening	128	10	3	6

Circulation of books.	No. of Entries. Town.	Country.	Total.
April	168	117	285

Carriage paid, £2 4*s.* 3*d.*

The undermentioned donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Report on the Progress and Condition of the Royal Gardens at Kew, during the year 1882. From the Director.

Statements of W. T. G. Morton on his claim to the discovery of the anæsthetic properties of ether; Report vindicating the right of C. T. Jackson to the discovery, etc., 1853.

City of Boston, Annual report of the Inspector of Vinegar, 1884. From Dr. B. F. Davenport.

Flückiger (F. A.), Grundriss der Pharmakognosie, 1884.

— Indische Pharmakognosie, 1884. From the Author.

Bentley (R.), Student's Guide to Systematic Botany, 1884. From the Author.

The Committee recommended the purchase of the undermentioned works:—

Keith Johnston's Atlas of Physical Geography,

Wanklyn and Chapman, Water-analysis, 6th ed., 1884.

Ramsay (W.), Experimental Proofs of Chemical Theory for Beginners, 1884.

Bentley (R.), Student's Guide to Systematic Botany, 1884.

Henfrey (A.), Elementary Course of Botany, 4th ed.

The Librarian having announced the need of more shelf room, it had been arranged that the President should consider how increased accommodation could be provided, and report to the Committee.

The Committee had ordered that the Library and Museum should be closed in the evening of Wednesday, May 21, and on Whit Monday, June 2.

The Committee recommended that sundry numbers of the *Pharmaceutical Journal* required by the Chemical Society to complete a set should be supplied.

Curator's Report.

The Curator had reported the attendance in the Museum during April to have been:—

	Total.	Highest.	Lowest.	Average.
Morning	500	38	15	20
Evening	134	11	3	7

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

A series of herbarium specimens of Natal plants. From Mr. J. Medley Wood, Curator of the Botanical Gardens, Durban, Natal.

Specimens of perfect crystals of Arragonite and Quartz. From Professor Leon Soubeiran

A series of herbarium specimens of rare medicinal plants. From Mr. Thos. Hanbury.

The Professors had attended and reported satisfactorily of their respective classes.

The late Mr. Peter Squire.

The report also referred to some correspondence with Dr. Balmanno Squire relative to his desire to found a prize in connection with the Society to perpetuate the memory of his father, Mr. Peter Squire.

Certain books had been ordered to be sent to the Library in Scotland.

The report and recommendations were received and adopted.

BENEVOLENT FUND.

The report of several members of Council, who had acted as an interim committee, and examined the applications for relief sent in to the Benevolent Fund Committee, was read. The report included a recommendation of the following grants:—

£5 to a life member, since 1864, aged 47. Many years in business, but now out of employment, having eight children, seven of whom are dependent on him. Surrey.

£10 10*s.* towards securing the election of an orphan

rl, to the British Orphan Asylum, to be expended at the discretion of the Secretary. Sussex.

£5 to the widow of an associate, aged 54, suffering from ill health, and with an invalid daughter. Applicant has had six previous grants. Middlesex.

£15 to the widow, aged 56, of a registered chemist and druggist, and member of the Society for fourteen years. Applicant has had three previous grants. Northampton.

Some cases had been deferred for further inquiries, and some the Committee had declined to entertain.

The following letter had been received by the Secretary from Mr. W. H. Baigent, of Shefford, Bedfordshire, who last month presented a hundred guineas to the Fund:—

"*May* 14, 1884.

"My dear Sir,—After seeing you on Monday it occurred to me that perhaps the Council might be disposed to entertain the subject of augmentation of the pensions, in the first place taking the higher grade and gradually increasing the pensions to £50 per annum, with this proviso, that the annuitants be founders, pharmaceutical chemists, or subscribers to the Benevolent Fund for more than six years, and also that their income from all sources shall not exceed £40 per annum.

"I have lately had under my notice several who in former years have held higher positions but are now reduced to seek help from our pension fund.

"I think if this plan could be entertained it would cause many more to subscribe to the Benevolent Fund, and establish a social feeling in the Society which might bear some good fruit.

"Yours truly,

"Elias Bremridge, Esq. "W. H. BAIGENT."

The VICE-PRESIDENT, in moving the adoption of this report, said Mr. Baigent's proposal had received the earnest attention of the Committee, but, on the suggestion of Mr. Bottle, it had been decided to ask the office to furnish information as to what number of persons would be affected by the proposal. The impression of the Committee was that the number would be very small, so that even if the suggestion were adopted it would not make much difference financially; but if the figures should show, on the contrary, that a large number would be eligible for receiving the increased grants, he should personally feel bound to oppose it. His feeling was that it was a much greater gain every way to give a smaller sum to a greater number of people than to advance the comfort of a restricted number. When he thought of the large number of applicants who were kept back for want of funds, and the value which even £30 year was in saving persons from absolute destitution, he thought the Council should go in for extension of the area of relief, rather than increase of the amount. One other point had been mentioned to which he should like to call attention. The desire of the Committee was that the influence of the local secretaries should be more largely made use of in aid of the Benevolent Fund, and one suggestion made was that all the action of the office with regard to particular cases should go through the local secretary; that instead of sending out forms of application to the applicant, they should be sent through the local secretary who would thus form the medium of communication with the office. It seemed to him that that would be imposing an unnecessary burden on the local secretaries, and he feared it would rather interfere with instead of facilitating applications. The Committee did not very favourably receive the suggestion, but were quite unanimous in recommending that whenever the information supplied was in any way defective the local secretary should be at once communicated with and asked to furnish additional information.

Mr. ROBBINS said the question raised by Mr. Baigent's letter was most important, but he did not know that his suggestion was the best which could be made. He rather thought that a plan which he himself suggested some time ago would be preferable, and which he still believed would prove of great advantage to the Fund, viz., that every annuitant who had formerly subscribed twenty guineas to the Fund should be entitled to £50 a year, and those who had subscribed ten guineas to £40 a year. After giving a great deal of consideration to this question he had come to the conclusion that such a plan would be of great service to those who had formerly moved in a good position in society, and had been unfortunate, but to whom £30 a year was a miserable pittance, and was just the same amount as was given to those who had never contributed anything to the Society, and had never moved in the same position of life. From another point of view he thought it would be advantageous, for if it were known that by subscribing a certain amount persons would receive a larger income if reverses came, there would be a much greater number of subscribers than at present, and thus a large addition would be made to the Fund, whilst at the same time very few of the subscribers to the amounts named might ever be expected to become applicants for relief. Very few, comparatively, who had subscribed to the Fund had ever applied for its benefits, and he believed only one who had subscribed ten guineas.

The PRESIDENT said these remarks would be more appropriate at the next meeting, when the Committee would have probably made a report after having considered the statistics which the office would furnish.

Mr. SYMES observed that on Mr. Robbins' own showing those who subscribed were never likely to want assistance from the Fund, and, therefore, he could not see that the motive held out would have much operation. This proposition was something in the nature of a mutual insurance fund, but as a benevolent fund scheme he thought it was altogether impracticable.

Mr. ROBBINS said several cases had come under his notice in which he was very sorry that the Council had not the power of giving more.

Mr. BOTTLE said he did not propose to follow up the discussion on this letter, because it would be premature to do so at the present time; but he wished to correct a little misapprehension which the Vice-President had evidently fallen into as to the suggestion he had made to the Committee. His idea was that without waiting for the Committee to meet and consider the applications, the office should, immediately on receipt of an application, communicate with the local secretary and obtain all information possible with regard to the case, so that it might all come before the Committee at the same moment.

The PRESIDENT, in corroboration of what had been said by Mr. Symes, thought Mr. Robbins rather mistook the object of the Fund when he made the proposal to which he had now referred, and which he had brought forward from time to time. The Fund was a benevolent fund, and he could recognize no difference between the case of a man who had been in receipt of £5000 a year, and one who had only had £100 a year all his life, when he came to ask for assistance. It was contrary to the true spirit of benevolence and to the catholicity of charity to make any artificial distinction between one man and another. If Mr. Robbins were very enthusiastic about this scheme it was open to him to suggest the foundation of a Mutual Insurance Fund, such as was actually in contemplation among the medical profession at the present moment; but on the lines on which the Benevolent Fund was constituted the Council could not touch that question, or graft a mutual insurance scheme upon a benevolent fund. Moreover, it would spoil one of the greatest gifts the Society had ever conferred upon the trade, which was effected when, by the Act of 1868, the benefits of the Benevolent Fund were thrown open to all persons upon the Register, whether connected with the Society or not.

Mr. ROBBINS said he did not recommend a mutual insurance scheme.

The PRESIDENT said it came to very much the same

thing. The Fund was essentially one for the relief of distress, and if it were desirable to give £50 a year to anyone of a certain age, it was desirable to give it to everyone who presented proper credentials.

The report and recommendations were then received and adopted, and an additional grant of £10 for the support of two of the Isherwood orphans was also made, the application for the usual quarterly payment having been received that morning.

THE INAUGURAL ADDRESS IN OCTOBER.

It was resolved that the Library, Museum and Laboratory Committee be authorized to make arrangements for the delivery of this address.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The thirteenth general meeting was held at the Royal Institution, on Thursday, April 24. The President, Mr. [illegible] in the chair. The minutes of the previous meeting were read and confirmed, and the following donations to the library were announced:—The *Pharmaceutical Journal*, from the Society; the *Canadian Pharmaceutical Journal*, from the Editor; the *Science Monthly*, from the Editor.

In the absence of the Secretary, Mr. A. C. Abraham read the following paper, entitled—

SUGGESTIONS UPON THE PREPARATION OF LARD.

BY F. A. BROWN.

In the short paper which I have written, I shall endeavour to show that lard can be prepared on a small scale, easily, cheaply and reliably.

No doubt from its being so largely used by pharmacists, its preparation has not received that amount of attention it requires. I believe (in fact, I am certain) there are a great many retail chemists who buy their lard from pork butchers or provision merchants by the bladder, or else what they term "home rendered."

A few years ago, I was persuaded by a tradesman to try some of his "home rendered," which I was assured was beautiful, as it had been specially rendered. To all appearances it seemed a good sample. With this I prepared some zinc ointment as an experiment; in less than a week I had to throw it away as the smell from it was abominable.

No doubt the bladder lard is the most reliable that can be bought from the class of tradespeople I have mentioned. My advice is, do not buy lard; prepare your own, but not according to the B.P. process.

The first thing to be done is to procure some good flare from a reliable source; choose the thickest you can get, and when you can, from a pig that has been fed with good food. Having obtained what you consider a good piece, hang it up freely exposed to light and air for a week or ten days, then proceed as follows:—Cut away as much of the membrane as possible, then beat it well in a mortar (which will cause the fat to melt at a lower temperature), melt over a water-bath, taking special care that the temperature does not exceed 130° F., strain through flannel; then you will have a beautiful white preparation of good consistency and free from smell.

The two chief points are having good flare and the temperature at which it is melted. If it has been well washed, the fat can be melted at 110° F. By the experiments I made the amount of lard produced from the flare was 86 per cent.; the thicker the flare the greater the percentage. The directions in the B.P., "break up the masses of fat with the hands, exposing every part to the water," I think is a mistake, as it causes the lard to turn rancid. None of us would think of putting cod liver oil in wet bottles, therefore we should not let water come in contact with the broken-up fat.

Lard prepared by the process I have described will keep good in colour and free from smell for over twelve months, as will zinc ointment prepared with it. I have used it in making red and white precipitate ointments, using one ounce of white wax to each pound of lard in the summer months and rather less in the winter. I have found these to keep good in colour and free from rancidity for over three months. I think that is as long as they are required to keep good in most pharmacies.

A vote of thanks to Mr. Brown having been passed Mr. Davies delivered the following—

VALEDICTORY ADDRESS.

It is my pleasant duty now to close the proceedings of the session with a few words of farewell. We have, I trust, usefully employed some of our winter evenings in imparting and receiving knowledge, and now the approach of summer calls us to the more appropriate study of nature herself, to learn our lessons from the ever open book which she spreads before us, and I hope to receive renewed physical vigour in the fresh air by the seashore. What lessons we may learn I hope we may be ready to impart, and that the summer may ripen a harvest on whose fruits we may feed next session.

It is usual to review the work of the session in the valedictory address, but I think you will scarcely thank me for a dry *résumé* of the papers read and the communications received. Rather would I in general terms express an opinion that we have had success quite equal to our expectation. Papers have come in to supply every evening, they have been varied in character, whilst they have all had a direct reference to the objects of the Association, and they have exhibited no inferiority to those of former sessions. Old members of the Association have shown that they have not forgotten us, though no longer in our ranks, whilst some who are still with us and on whose readiness to come forward we can always rely, have again paid the debt we owe them by increasing our indebtedness. Nor have we been without new recruits, who have broken through the trammels of fear and have made that first step which is to inaugurate a march along with the veterans of our army. Would that there were more like-minded, who would find that they may learn by teaching, and who will find no stern critics, but rather helpers and encouragers in their early endeavours.

Miscellaneous communications have been fairly numerous, and have given opportunities to those who shrink from a paper to impart the results of their investigations.

We have received donations of specimens, books, and journals, by which our Museum and Library have been enriched, and for these our grateful thanks have been tendered.

I am thankful to believe that death has not been busy in our ranks, but departure from Liverpool has removed some. Of these the most conspicuous was Mr. Mason, a personal friend of me and many, whose kindly help as Vice-President was extended to me in the discharge of the duties of the chair, who could always be trusted to for a paper, and whose fearless yet courteous discussion of the topics arising at our meetings tended to prevent us falling into the weakness of being a mutual admiration society. We must hope that our loss may be repaired by more energetic action on the part of those who remain, and by additions to our ranks from without. In this last respect I am sorry that this session has not added many to our ranks, but I trust that by the extended freedom and range of subjects now offered those who have fought shy of pure science will be attracted. I would even hope that the bane of Liverpool societies for the advancement of knowledge, that is, their excessive multiplication, may be attacked by us, and that those who study the same things in pharmaceutical matters may study them together. One of the oldest

societies in Liverpool would then set an example to the rest, and so develop strength by concentration of effort.

In looking forward to the employments of the recess, I would strongly urge the study of botany. No science can beat it for dryness if studied from books alone, none for interest if studied from nature. Let every fact be verified by the student for himself; let the plant explain the terms, and it will be found that botany is not a vocabulary of Greek and Latin words, nor even the collection of more or less rare plants in a herbarium, but that it is the study of life in its most varied forms, that it is full of surprises in the adaptation of means to ends, and whilst neatness and skill are taught in the dissection needful, yet there is not that suspicion of cruelty which attaches to studies of animal life. If a student cannot get much into the country, yet in our market a constant supply of many wild flowers can be got, and over the water on Bidston Hill or Oxton Heath some rarities may yet be found in the compass of an evening walk.

I must now come to a conclusion. I have enjoyed my year of Presidentship from the kind assistance which has been extended to me, although it has entailed labour upon me I had at one time hoped to escape. If my efforts have been of any use, I have been amply rewarded, but it is on you that the success of the Association must depend. It is only by the willing co-operation of all that the Association can maintain its position, and I call upon all to lend their aid so that it may still rank among the societies of this city, which have for their object the raising of the minds of its citizens above the considerations of the mere mechanical routine of life, whilst that very routine is assisted and developed into intelligent and wisely directed work.

After the conclusion of this address the election of the President for the ensuing session was proceeded with, when Mr. E. Davies was unanimously re-elected President.

This concluded the business of the meeting.

Proceedings of Scientific Societies.

INTERNATIONAL HEALTH EXHIBITION.

On Wednesday last the first of a series of Conferences, which it is intended to hold in connection with the International Health Exhibition, took place in the arena of the Albert Hall, under the presidency of the Right Honourable the Lord Mayor. As many of the subjects announced to be discussed at these Conferences promise to be of interest to the readers of this Journal, we purpose as far as possible to give a weekly *résumé* of the proceedings.

The first paper read was by Mr. G. B. Longstaff, on "The Population of London and its Migrations." The author first referred shortly to the populations of some of the chief ancient cities as being large compared with most of the capitals of modern Europe. Similar reference was also made to other large cities of the present day, but, said the speaker, "such an agglomeration of human beings as is now living, toiling, suffering, pleasuring, entering the world and quitting it, in modern London is absolutely without precedent in ancient and modern civilization." London proper contains more people than Paris, Berlin, and Brussels together; and the greater London includes within the Metropolitan Police District has little short of five millions. A large and important city it had been since the Roman occupation, and Good Queen Bess thought it large enough, in 1580, when she forbade the erection of new buildings, as the extension of the Metropolis "was likely to increase the plague, to create trouble in governing such multitude, a dearth of victuals, the multiplying of beggars, the assemblage of more artizans than could live together, and, moreover, as likely to impoverish other cities for lack of inhabitants." But London was not yet grown up and was still growing at the rate of 50,000 a year, 1000 a week, or 150 a day! Statistics followed showing the increase of population and the birth and death rate in London as compared with other cities. With regard to immigration into London, it was somewhat surprising that Scotch, Irish, foreigners and colonists together only numbered some 6 per cent., but it must be borne in mind that their children were of course classed among the London born. Of the foreigners Germans were the most numerous, and next came French, Poles (mostly Jews and very poor), Dutch, and Italians. No great manufactures were carried on in London save in connection with furniture and books; and some interesting though voluminous figures were given of the persons following various occupations. The very poor class numbered 100,000, and there was a much larger number but very little removed above them. The speaker confessed himself a disciple of Queen Elizabeth, and wished something could be done, if not to diminish the number of inhabitants, at least to prevent their increase. Emigration was the only practicable remedy, but should not be promoted from London itself, merely, as for every family sent away from it two would rush in from the provinces, and even from Ireland, and country people made far better emigrants than townsmen. In fact, everything possible should be done to discourage immigration into large towns. With regard to the administration of London, the governments in the thirty-nine districts occupying twelve miles from north to south and seventeen from east to west, and supposed by common consent to be utterly incompetent, had, at all events, reduced the average death-rate to 22·5 per 100, which was much exceeded on the continent of Europe, as for instance, in Christiania, a mere village in comparison.

In the discussion that followed, Canon Gregory, referring to the "migrations of the people," said that when he was in Lambeth it was calculated everybody in the parish removed once a year; but they did not go far enough. Decent accommodation could be found for all if they could but be brought to the thousands of unoccupied houses in the suburbs, and the problem was, how was that to be brought about?

The second paper was read by Mr. Toynbee (for Miss Gertrude Toynbee), on the "Treatment of the London Poor." The writer argued that in addition to their material privations and sufferings the poor were almost entirely deprived of such friendship and social intercourse as other classes enjoyed, from the wretched character of their homes. In many houses with thirty or forty occupants scarcely a family had more that one room, the families consisting of father, mother, and sometimes as many as five children. Such places were not *homes*, and yet as much as 6*s*. a week was paid for them. The want of anything homelike in their dwellings was the key to much of the misery in the lives of the poor. Children especially suffered from it, and were thrust into vice, when with other surroundings they would become virtuous men and women. Many sanitary improvements were required in the dwellings of the poor, and at any rate efforts should be made to give the children some pure and bright experiences which would help to obliterate the evil in their minds. Purer recreation should be provided for old and young, men and women, in their leisure hours, week-days and Sundays, to enable them to forget the evils which could not yet be removed.

The Rev. A. Mearns followed with a paper on "Overcrowding." He said, though the urban average in England was six people to an acre, places existed where there were from six hundred to one thousand to one acre. Distressing details of overcrowding in poor neighbourhoods were given, and public improvements, high rents, and the necessity of men living near their work were mentioned as the chief causes. Its physical results were bad enough, being of course a fertile source of disease, but its moral effects were fearful to contemplate The

registration and official inspection of all property let out in rooms would do much to remedy the evil, and under the Glasgow Police Act that system was at work with good results. Artizans' dwellings should be erected at rents which could be paid by the very poor, and on the authority of Miss Octavia Hill they would still yield a fair percentage upon the capital expended.

The second Conference on the "Dwellings of the Poor" was held under the auspices of the Mansion House Council, on Thursday, in the Royal Albert Hall. His Grace the Archbishop of Canterbury in the chair.

The first paper read was on "Suburban Dwellings and Cheap Railway Fares," by Mr. James Hole, who stated that the increase of the population of London was about 50,000 per annum, and that all the efforts of benevolence in the past twenty years would not provide the accommodation required by one year's increase. The exigencies of space in London proper only permitted of the block system for the growth of population, and he recommended the single dwelling outside London where the tenant could have a few yards of garden, breathe pure air and cultivate the home feeling such as he could never experience in buildings constructed like barracks. After referring to the labours of the Artizans' Dwellings Company, which had completed estates at Shaftesbury Park of about 1200 houses, and at Queen's Park, Harrow Road, of 2170 houses, and was now erecting 2600 houses at Noel Park, near Hornsey, the rentals of which ranged from 6*s.* to 11*s.* 6*d.* per week, Mr. Hole stated that one great benefit to the poor was that public houses were not permitted on these estates. To ensure the success of these schemes it was necessary that the railways should be induced to afford adequate facilities at reasonable rates, as the so-called workmen's trains did not meet the necessities of the case. He proposed the creation of a paid Government Dwellings Trust, with the necessary powers to carry out working class model towns, the funds of which should be derived by the issue of debentures; secondly, the contributions of the working classes in the repayment of the mortgages; and, thirdly, if the above was not found adequate, by a Government loan.

The second paper, by Miss Lidgett, was upon "The Treatment of the London Poor." After describing the horrible condition of the dwellings of the poor and the almost hopeless task of improving them, reference was made to the labours of Mr. Ruskin and Miss Octavia Hill to improve the dwellings of the poor, to the efforts made to teach the people how to keep them clean and how honestly to pay for them. This was not a matter of mere bricks and mortar, of plaster and whitewash, that could be ordered or inspected by public authority, but was a work that for the most part must be done by ladies.

The third paper was by Mr. H. D. Harrod, on "The Creation of a Building Fund," his opinion being that purely voluntary effort was insufficient to meet the exigencies of the case. There was a commercial and a philanthropic side to the problem which it was desirable to keep apart. A commercial company was hampered by the desire to make a dividend, and a large public trust was therefore in many ways preferable. Taking Mr. Shaw Lefevre's figures as a basis, land purchased by arbitration, without the compensation given under the Lands Clauses Act, would cost 8*s.* per foot, or £17,424 per acre. Dealing with forty-two acres, of which one half would be covered, the other half being left for roads and open spaces, the cost would be about two and a half millions. The rents should be 2*s.* 6*d.* a room or 4*s.* for two rooms; and on this basis the income would be £148,512, out of which, allowing two-fifths for expenses, repairs, etc., there would be a net income of £89,108, which would pay interest at 4 per cent. on nearly the whole capital, leaving but a small outlay to be made from the Trust fund. If half the amount required could be borrowed from the State at 3 or 3½ per cent., there would be no difficulty. Such a scheme would provide for 47,140 persons. The Trust might also assist private enterprise in the same direction with loans of capital at moderate interest. In conclusion, the philanthropic side of the problem might be provided for by adopting Miss Octavia Hill's system of employing ladies as rent collectors, who would make friends of the tenants and help to raise their moral tone in every way.

The Chairman was glad that at last public attention had been called to a matter to which earnest labourers had been trying to call attention for forty years, for now they might expect some good to arise from the agitation. Ages ago the idea of a Greek or Roman city was that it should be compactly built, with very little knowledge indeed of sanitation, but with the proviso that all round about the walls there should be a great area of common land. Still it was almost too much to hope to have great rings of land around the villages and towns of England. It had been well suggested that great things might be done by enabling the working classes to own their own houses; but they knew, as practical people, that such a time would not come to pass, though to a certain extent it might be the case. Everyone would agree that it was not good for human beings to be in the hands of middlemen. Another question which seemed to be in a fair way of settlement springing out of the creation of rural villages was that of intemperance. He did not wish to be chimerical and to see the whole of the land covered by model dwellings, for he thought the artizans did not like living in model blocks; they preferred to live in houses or cottages which could be rendered tenantable. It must not be forgotten that the poor were human beings, and as birds and beasts liked to make their own nests and lairs, and as the most polished specimens of the human race spent perhaps a disproportionate time in beautifying their dwellings, as far as possible every workingman should be allowed to have some kind of voice in buying his own house. All honour was due to those who, in the first instance, had attempted to deal with the subject. While many people starved the masses will hear those who associated with them generally took the kindest view about them, and he fully agreed with what Miss Lidgett said about talking to the poor about religion. All men should remember that the poor were of the same flesh and blood as themselves, and if the rich would associate more with them and learn to love them England would be a much happier land than it had ever been.

Reviews.

A Treatise on Chemistry. By H. E. Roscoe, F.R.S. and C. Schorlemmer, F.R.S. Vol. III.; Organic Chemistry, Part II.*

We are glad to receive a further instalment of this valuable and comprehensive work on 'Chemistry.' In these days of little books and books to match the necessities of particular sets of students, or the demands of specified examinations, though many of them have their value, one welcomes the appearance of volumes which deal with their subject, be it chemistry or any other, with the sole object of producing what shall be at once a history of past successes, and by their clearness and completeness in detail lead on the student to that mastery which alone is the parent of discovery and so help him to future triumphs. For the genuine student who wants to know chemistry and not to "*get it up*" this is one of the best treatises ever written on the subject.

The part of Professors Roscoe and Schorlemmer's book which is now before us begins with an account of the divalent alcohol radicles, and their compounds and de-

* London: Macmillan and Co. 1884. Demy 8vo. Pp. i.–xii., 1–655. 21s.

rivatives, and includes the uric acid derivatives, the trivalent alcohol radicles, the univalent alcohol radicles of the C_nH_{2n-1} series; also the oleic acids, the $C_nH_{2n-1}(CO_2H)_3$ acids and those allied to them, the acetylene or ethine series of alcohol radicles, the drying oils, the alcohols of the quadrivalent and sexvalent radicles, the carbohydrates, the furfuryl group, and the meconic and tetrinic acid groups. In short, it brings us to the aromatic compounds, which we may look for in the next portion of the work.

As in the previous volumes these writings on chemistry are distinguished and their interest is heightened by their valuable historical details and the copious references to original sources of information, whilst we again find much attention given to important industries connected with the subject, such as sugar making and refining, and paper making, though from the nature of the case the space devoted to such matters is somewhat less than in some of the earlier volumes. We cannot, however, speak quite so well of the treatment they receive in this section as we could wish. For example, we are sorry to observe some elaborate illustrations quite unexplained, *e.g.*, figs. 126, 127 are referred to in the slightest manner. They would, no doubt, be clear enough as they stand to those technically acquainted with the subject already, who, however, do not need them; but to students, for whom we may presume they are intended, they will be of little value. Similarly the chapter on saccharimetry, though technically sufficient, perhaps, is, in an essentially scientific book like the present one, disappointing. On the other hand, the purely chemical portions, which comprise the vast majority of the book, are most valuable and will thoroughly maintain its high reputation. The general account of the ethene group, with which the volume opens, is extremely clear and will be found most valuable. There are misprints here and there, but they do not seem to be numerous.

In concluding our remarks, we cannot help expressing our wish that chemists would come to some agreement in the use of terms. In the book before us we find, for example, such expressions as "divalent or diatomic alcohol radicle." At present, no doubt, this is done in the interest of students who may be familiar with expressions on one or the other system only. In the long run, however, the difficulties of utilizing the study of chemistry as a method of training are greatly added to by the needless trouble given by having two or more names for one thing in so many cases. An eminent physiologist lately warned science teachers of the danger they are always in of ceasing to teach science and of teaching its dry bones, its terminology, instead. The difficulties of teachers of chemistry are already very great in this direction on account of the imperfections of its terminology, and we feel that it is to the writers of the leading text books that they must look for help in this matter, for in this they must follow the books.

The Student's Guide to Systematic Botany. By Robert Bentley, F.L.S., M.R.C.S. Eng.*

This little work is intended to form a supplement to the 'Student's Guide to Structural, Morphological and Physiological Botany,' lately published by the same author. Systematic botany is often taught at a different time of year from structural botany, and the appearance of a small and very portable volume on the former subject, which can easily be carried in the breast-pocket, will be a boon to the class of students who have hitherto had to carry the 'Manual,' which, however valuable as a work of reference, is by no means convenient for out-door study. The author believes that the work now under consideration "will form a most convenient and handy little volume for use abroad and at home by medical, pharmaceutical and other students who are desirous of obtaining a good practical knowledge of some of the more important natural orders and their medicinal plants, and also as a foundation for further study." As a matter of fact, the author has condensed into this book the systematic portion of his Manual by omitting the portions relating to the uses and properties of the plants of the different natural orders, as well as the detailed accounts of economic plants, the description of the natural orders being thus compressed within one hundred and thirty-six pages. The remaining pages are devoted to descriptive botany, which includes two chapters, the first giving directions for examining and describing plants, and an explanation of the abbreviations and symbols used in doing so, and the second containing nineteen descriptions of medicinal plants at full length in illustration of the directions given in the first chapter.

This portion of the work will be found exceedingly useful to the student. The plants used as illustrations are most of them easily obtainable and belong to different natural orders, so that the student will find them to answer a double purpose, since they not only serve as models for describing plants, but as a key to explain many points that might prove puzzling to a beginner.

The systematic portion of the work possesses the advantage that it cannot possibly be used for "cramming" purposes. The only way to use it is to examine, book in hand, the different genera of each family, as far as obtainable, in a botanical garden, and even then probably the student will require the assistance of his professor to explain the value of such descriptions as "leaves alternate or opposite; corolla of 3 to 15 usually 5, distinct petals, regular or irregular, sometimes absent."

The long experience of the author in teaching botany has doubtless shown him that a thoroughly inclusive description is the best form in which the natural orders can be presented to students; but as a foundation for further study, one feels that it would be less puzzling to begin with something simpler, and that the relationship of the natural orders would be more easily remembered if they were accompanied with some hints such as are met with in works like Lindley's 'Natural System of Botany.'

Those, however, who are accustomed to the well-known Manual,—and they certainly form a considerable proportion of botanical students,—will gladly welcome the portable little volume now under review, and those who will take the trouble to thoroughly follow out the directions given under descriptive botany are not likely to fail in describing a plant at their examination, even if the specimen be one unknown to them.

* London: J. and A. Churchill. 1884. Fcap. 8vo. Pp. i.–xii., 1–178. 3*s.* 6*d.*

Die Parfumerie Fabrication. Von Dr. chem. G. W. Askinson. With Twenty Illustrations. Second Edition.*

This little volume on the manufacture of perfumery is one of a valuable series of works on chemical industries by the same publisher, all of which are remarkable for the large amount of really valuable information condensed into a small space. The present volume is no exception to the rule. On turning to the list of contents, one is surprised to find that in three hundred and sixty-four pages, no less than thirty-one chapters are comprised, each of which contains thoroughly practical and useful information. The illustrations given are of apparatus, not of plants, and such information as can be readily obtained in works of materia medica, such as the preparation of the oils of lemon, bergamot and otto of rose, will be sought for in vain here; but instructions as to the quality, tests of purity, uses, etc., are found instead. The author, being himself a manufacturer of perfumery, has treated the subject from a business point of view. In the preface he states that the receipts which he has given are those which he has himself found to be valuable and that he prefers to give a few that are reliable rather than a number which he cannot honestly recommend.

The formulæ given seem to bear out his claim, the

* Vienna: A. Hartleben. Crown 8vo. Pp. i.–iv., 1–383. 4 Mk. 50 Pf.

majority having sufficient of the staying element in them to produce powerful and lasting perfumes.

Besides receipts for perfumes for the handkerchief, the book contains others for smelling salts, toilet vinegars, pot pourri, pastilles, incense, cosmetics, perfumed pastes, powders and jellies, pomades, bandoline, tooth powders, finger nail powders, hair dyes, rouge, etc.; in fact, it embraces the whole range of the perfumer's art. The only drawback to the book is that it is printed in German type and that the whole of the information about any one perfume or oil cannot be found under one head. Those of our readers who understand German will find the book worth purchasing, if only for the recipes it contains, and those who do not will not have great difficulty in making out, with the aid of a dictionary, the names and proportions of the ingredients. If here and there a statement occurs such as that the root of opopanax has a pleasant odour, the trite saying *de gustibus non disputandum* may be called to mind. In this instance, moreover, the author honestly states that the opopanax perfume has a very different source.

BOOKS RECEIVED.

WATER AND WATER SUPPLIES, AND UNFERMENTED BEVERAGES. By JOHN ATTFIELD, Ph.D., F.R.S. (International Health Exhibition Hand-book). London: Clowes and Sons. From the Author.

HOW TO ARREST INFECTIOUS DISEASES. By EDGAR G. BARNES, M.D. London: J. and A. Churchill. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE ELECTION OF COUNCIL.

Sir,—It is at once a curious but interesting feature in the history of the contested elections for the Council of the Pharmaceutical Society, that between the years 1870-1881, there was always a vacancy to be filled up when the time for election of the new Council arrived. During the last four years, however, all the old members of Council have stood the contest and been returned, as a body; but it is nevertheless true that the majority is steadily decreasing, since in 1881 it was 448, in 1882, 336, in 1883, 281, and now it has fallen to 254.

One cannot but congratulate the successful candidates upon their re-election to the Board duties; but as one of the 1287 who took sufficient interest in the affairs of the Society to return their voting papers, I trust the remarks in your leading article of last week will direct the attention of the Council to the urgent necessity of adopting some means of eliciting the sympathy and interest of the remaining 2385 to whom voting papers were issued.

Such a vast proportion of apparently disinterested members (the largest, I believe, since 1876) should at least raise the question, Are there sufficient local secretaries? Are they encouraged to interest country members in matters relating to the Society's welfare? or are they only a collecting medium for picking up the annual guinea from defaulting members?

Would it not be wise, would it not be a gracious act for the Council to encourage the furnishing of reports by the local secretaries, whereby the governing body might become better acquainted with the state of trade generally and the requirements arising from different conditions in the smaller towns, where, indeed, the health of pharmacy is just as much to be advised as in the large centres of industry and wealth? Such means would, I believe, be fraught with most beneficial results, since it could not fail to impress upon our minds that the work of our Council for legislative and pharmaceutical reform would then be better guided for the benefit of the whole body of chemists.

11, *Strand, Torquay.* CHAS. SHAPLEY.

NOTICES TO OFFENDERS.

Sir,—The President, in his address at the Annual Meeting, referred to what to him appeared the mistaken view of some members, in thinking that no letter of warning should be sent to offenders against the Pharmacy Act previous to proceedings being taken. As an ordinary member I hardly like to differ from so high an authority, but it is evident I am not alone in my views. It is a most courteous and honourable way of carrying out the Act, and doubtless offenders fully appreciate it, but I very much question its policy. It is, I believe, generally known that trading in poisons by others than chemists is illegal, else why should there be such an expression of surprise that poisons are so readily obtainable at almost every inquest on what may be termed "illegal cases of poisoning?" Besides which ignorance of the law is never admitted in other cases as an excuse for non-compliance with it.

It seems to me that we are treating others in a way that we should not expect to be treated ourselves. If a chemist sells methylated spirit without a licence, I do not think the Revenue Authorities give him notice before proceeding against him, and I doubt very much if the Treasury would entertain any application for a remission of the penalty, and to take a more extreme case, if a chemist poisons a customer it is not very probable that he would receive a letter warning him not to do it again or else proceedings would be taken against him. If traders know that they will be warned they feel perfectly safe until they receive that warning, naturally omitting to use any labels whatever, in order not to attract notice and so postpone the receipt of the warning as long as possible.

To my mind it appears that we are neglecting our duty in not stringently carrying out the provisions of the present Act, and in the present state of the public mind I do not see that we are justified in asking for further powers when we do not use those we possess to their fullest extent. If there is any hardship in enforcing the law, the responsibility rests with those who made it, not with those who have to carry it into effect. For the public good we are entrusted with this duty, and we have no right to condone any offence on the promise of better behaviour in the future. We are taking a responsibility with which we have not been entrusted and neglecting to use fully the powers which have been given us. Surely with a surplus income of £1500 we can afford to do our duty in this respect, and show that we can safely be trusted to sternly enforce the poison regulations of the future.

GANDULPH.

Photographer.—(1) *Lysimachia nemorum.* (2) *Ajuga reptans.* (3) *Linaria cymbalaria.*

A. P. S.—It is open to doubt which preparation is intended; but in the event of not being able to refer to the prescriber, Liu. Bellad. Co. (Squire) would be the safer to dispense.

Tik.—Liq. Cinchonæ, B.P.

T. C. H.—The coloration has been frequently observed, but has not, so far as we are aware, yet been explained. Neither has it been noticed to be particularly associated with alkalinity. The subject appears to be worthy of further investigation.

C. J. B.—The mixture becomes opaque and there is a flocculent separation; but if the quinine, previously to its addition to the infusion, be dissolved in a little nitric acid there will be a little opacity, but no separation.

J. D. Pridgeon.—Tomes' 'Dental Surgery' (Churchill) and Coleman's 'Dental Mechanics.'

G. Horne.—(1) *Polygala vulgaris.* (2) *Valeriana dioica.*

G. S.—*Hypericum Androsæmum.*

S. H.—(1) *Prunus Lauro-Cerasus.* (2) *Fagus sylvatica* (purple variety). (3) *Aucuba Japonica.* (4) *Betula alba.* (5) *Alliaria officinalis.* (6) *Euonymus japonicus.* We cannot undertake to name garden plants. The specimens sent should include stem, leaves, and, when different in character, the root leaves also.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Horne, Morton, Bolton, Saul and Co., Wood, Lyle, Alpha, Neophyte.

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FOR FURTHER PARTICULARS SEE QUARTERLY PRICE CURRENT, pages 69 and 70.

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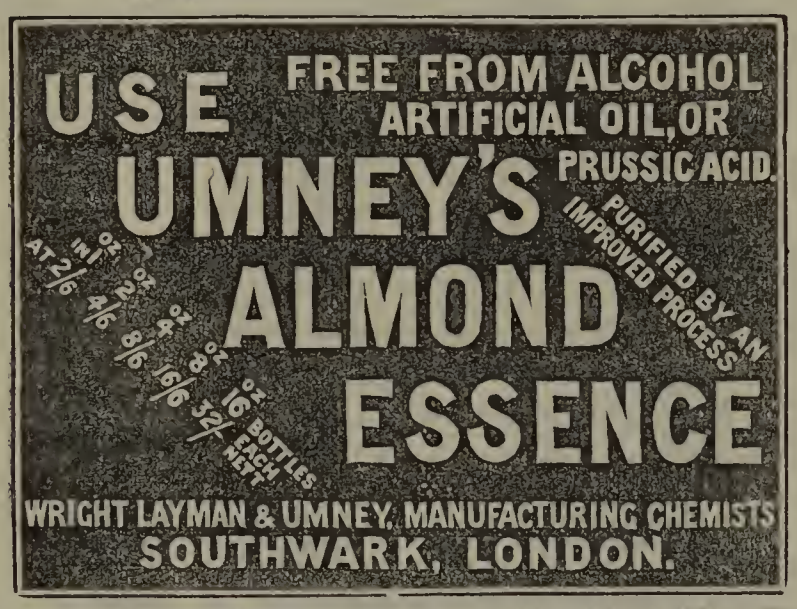

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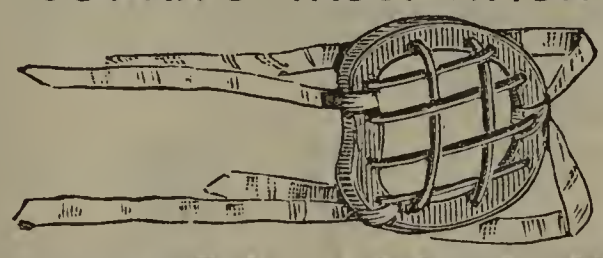

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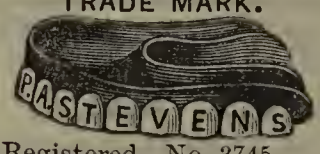

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Emp. Plumbi.
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For destroying ALL INSECTS and PARASITES that infest Trees and Plants, whether at the Roots or on the Foliage. It cures Mildew and Blight on Fruit or Foliage, and a weak solution Kills all Vegetable Grubs, Turnip Fly, &c. Clears Grapes from Mildew or Mealy Bug without affecting the bloom. Thickened with a little clay, makes a good winter dressing. Destroys Lice and Fleas on Animals and Birds. Sold by Seedsmen and Chemists, 1s. 6d., 2s. 6d., and 4s. 6d. a bottle; per post 3d. extra. Per gallon 12s. 6d., or less in larger quantities.

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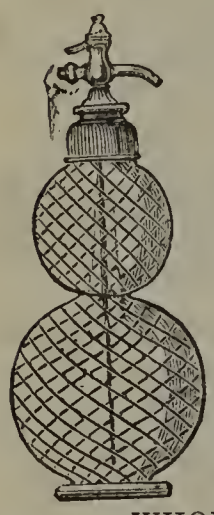

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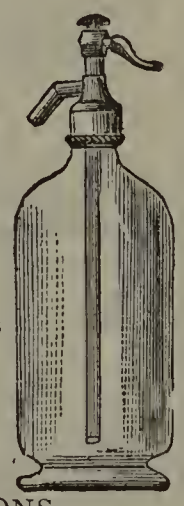

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Has been in use for over 60 years as an excellent remedy in cases of
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Sold by all Chemists in Large-sized Bottles (the 1s. size containing just double the quantity usually sold at same price) at 1s., 2s. 6d. and 3s. 6d. each.

CAUTION.—Observe the signature of the Inventor on every label.

His **FLUID CAMPHOR** is a valuable remedy for Sleeplessness and Weak Nerves.
Bottles, 1s. and 2s. each.

PURE CRUSHED LINSEED
CONTAINING ALL THE OIL.
Nothing better can be obtained.

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Special Quotations for 5 cwts. and upwards.

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These Preparations received a FIRST-CLASS AWARD (the Highest Obtainable), at the INTERNATIONAL MEDICAL AND SANITARY EXHIBITION, SOUTH KENSINGTON.

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AN examination for five appointments as Surgeon in Her Majesty's Indian Medical Service will be held in London on the 11th August, 1884, and following days. Copies of the regulations for the examination, together with information regarding the pay and retiring allowances, &c., of Indian medical officers, may be obtained from the Military Department, India Office, London, S.W. The necessary certificates must be sent so as to reach the Military Secretary at least a fortnight before the date of the examination.

ALLEN JOHNSON, Major-General,
India Office, 30th May, 1884. Military Secretary.

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To the October Examination ...	£2 2s.
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Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now begun for the term commencing Sept. next.

For Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

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BY qualified Chemist. Married. Age 34. 8 years in business on his own account. Situation as MANAGER of a Branch or DISPENSER to a firm of Surgeons, hospital or dispensary. CHEMIST, 140, Cheltenham Rd., Bristol.

LOCUM TENENS.—By a gentleman of long experience, to take charge during illness or absence. The highest references. Address, F. E. W. DECK, 109, Cornwall Rd., Bayswater.

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ASSISTANT.—A competent, with experience in good-class market town business of the better class. Of business like habits and equal to management when required. Hours easy. Very little Sunday duty. Salary £60. Apply, with the fullest detail, to "C.," care of Sangers, Oxford St., London.

MR. S. DANIEL, Pharmaceutical Chemist, Ramsgate is in immediate want of an Assistant.

JUNIOR Assistant, of good appearance and address, and well up in Dispensing, for a light Retail and Dispensing business. In-door. Apply, enclosing carte and references (to be returned), to G. Waterall & Son, Chemists and Opticians, Nottingham.

AT once.—An Assistant, in a light Retail and Dispensing business. Applicants please enclose photograph, references, and all particulars, to Mr. H. Badcock, 101, High St., Lymington.

A COMPETENT Assistant, of gentlemanly address accustomed to good class business. Apply, with particulars, to G. R. Warren, 29, Abbey Rd., St. John's Wood, N.W.

TOWN Traveller.—By a London Wholesale Druggist. A gentleman to represent the house in town. A preference given to a party having connection. Apply, by letter only, S. G., Messrs. Francis, Nicholls & Co., 14, Old Jewry Chambers, E.C.

FOR a watering-place on the Welsh Coast, for three or four months, an Assistant possessing the Minor qualification. Apply, J. B., care of Southall, Bros. & Barclay, Birmingham.

EXPERIENCED and energetic Assistant wanted. Age about 27. Apply, in first instance by letter only, to N. E., 77, Crofton Rd., Peckham.

A JUNIOR Assistant, not under 20. Apply, stating age, height, reference, and salary required, enclosing carte, to W. Rowland, Chemist, High St., Wrexham.

AT once, an Assistant for light class Retail and Dispensing. Not under 22 years of age. Applicants will please state age, height, experience and enclose carte (to be returned), J. Barnitt, 86, The Parade, Leamington.

AN Assistant, age about 23, for good class Family and Dispensing trade. Apply, stating height, salary required, and full particulars, to Messrs. George & Welch, Worcester.

IMMEDIATELY.—An experienced Dispenser and Bookkeeper. Age about 25. One who can Prescribe and visit on an emergency preferred. Good references indispensable. Apply to Surgeon, Collingwood House, Tunbridge Wells.

ASSISTANTS WANTED.

CHEMIST and Dentist, as Manager for a widow. Qualified in both branches preferred. In-door. Must be sober and have good references. Apply, with all particulars as to age, height, salary, &c., enclosing carte, to Arthur Peake, Chemist and Dentist, Earlestown, Lancs.

A JUNIOR Assistant, out-door. One accustomed to Dispensing and good class Retail. Hours 8.30 to 8.30, and 8.30 to 7 p.m. alternate. Usual particulars to J. Righton, 229, Lord St., Southport.

IMMEDIATELY.—An Assistant, about 21 years of age, accustomed to Dispense, Prescribe, Extract Teeth, and attend general Retail. Apply, stating salary and full particulars, with references, to Mr. Arthur Stooke, L.D.S., Chemist and Surgeon Dentist, Milton next Sittingbourne, Kent.

SHORTLY.—Two gentlemanly Assistants, not under 21, one as Dispenser (Major essential), the other to serve at the Retail counter, and possessing the Minor at least. Apply, stating full particulars to save time, and enclose carte, to E. H. Metcalfe, Pharmacist, Malvern.

AN experienced Assistant, for Dispensing and light Retail business. One only kept. Apply, stating salary, &c., R. Hiscock, Chemist, Coventry.

IMPROVER, or one who has served part of his time, and been accustomed to a good class trade. In-door. Salary according to experience. Geo. S. Highmoor, 46, Waterworks St., Hull.

AS Junior, in Wholesale and Retail and Dispensing. Age about 22. Hours 8 to 8, and 9 alternately. Little Sunday duty. Send age, height, reference, salary required, and photo, which will be returned, to T. Bailey, Chemist, Coventry.

A JUNIOR Assistant. Age about 25. Good salary. Apply personally, E. Lacy & Co., 156 & 94, Whitechapel Rd.

IMMEDIATELY.—A Junior Assistant for light Retail and Dispensing business. Apply, with usual particulars, to J. Davis, Chemist, Exmouth.

BUSINESSES FOR DISPOSAL.

ALMOST lucrative, small, light Business, Proprietary Prescribing, &c. Only 2 to 12,000 inhabitants. Receipts £8 weekly. Rent £19 yearly. Shop well fitted up; roller shutters. A chance rarely offered. Inspection solicited. Price £120. Only purchasers requested to write. Wilks, Chemist, Burnley.

ESSEX.—Unopposed, 5 miles from the sea, Retail and Prescribing Business. Rent £22, on lease. Good 9-roomed house and garden. Returning £600 at full prices. Shop is well fitted and stocked. Price £500, or offer. Thoroughly genuine reliable trade, and offers rare opportunity to anyone wanting nice country unopposed business. Apply to Messrs. Berdoe as above.

A GOOD Retail and Dispensing Business, with Post Office, which pays rent. Returns nearly £800. This is worth attention, advertiser having entered the medical profession has no time to attend to it, and will sell at a great sacrifice if sold at once. Address A. P. S., Messrs. Evans, Sons & Co., Liverpool.

FAMILY Retail, in main thoroughfare of large town on South Coast. Light and profitable. Position very prominent. Affords good scope for extension. Capital opening for Dentistry. Incoming about £300, on favourable terms. Address, H. Locke, 30, Cross St., Portsea, Hants.

WITH immediate possession.—A small but increasing Business, situated in a large neighbourhood of an important watering place. Unopposed. For particulars apply to A. S., 45, Kensington Rd., Southport.

BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer: East Coast. Fashionable resort. Dispensing and Prescribing trade. Returns £2000, net profit £600. Price £1600, part remain. Lincolnshire. Retail and Prescribing trade. Returns £1600. Large premises. £900. Lancs. Retail and Dispensing. Returns £1400. Net profit £450. For £950. Another, returning £700, taken larger trade. South. £600, or first best offer. Kent (Seaside). Prescribing and Retail. Returns £5 weekly. Capable increase. Rent £25. For £100. London, S.W. Handsomely fitted, well stocked Retail and Dispensing trade, neglected through serious illness. Returns now £8 weekly. For £250, or best offer. N.W. Commanding corner, good house. Returns by manager £8 weekly. Only £275. Owner never there. N.E. Corner Retail and Prescribing. Shows £310 net profit, for £360. Part remain. Also corner retail, taking £5 weekly, for £85. Apply 30, Jewry St., Aldgate, City. (No charge to purchasers.)

£240 or reasonable offer.—A light Retail in the most improving suburb of London. Returns approaching £400. Rent £32, which is almost paid by Post Office. For particulars, apply by letter, Mr. I. W. Fuller, 8, St. Thomas' St., Borough, S.E.

POTTERIES.—A good Business. Post Office attached, more than pays rent. Returns about £700. Several proprietary articles. Good house and shop. Capital opening for a beginner. Terms (easy) to be arranged. Address, Potteries, Messrs. Wyleys & Co., Coventry.

IN a market town, about 12 miles from London. An old-established Business, Family, Dispensing, and country trade. To be sold in consequence of death of proprietor, in whose family it has been for upwards of half a century. Long lease would be granted, good house and premises. To be sold cheap, about £1500 probably required. Apply to C. M., care of Barron, Harveys & Co., Giltspur St. London.

IMMEDIATELY.—One of the handsomest shops in the S.W. of London, doing about £650 per annum. All cash trade. In main road. Good sale of proprietary articles and Prescribing. Shop and house large and in good order. Satisfactory reason for disposal. Lowest price £440. Address, letter only, Chemist, 7, Hughenden Ter., Stanley Rd., Upper Teddington.

LONDON, N.—A thoroughly well established Business, in same hands 15 years. Returning over £700 at full prices. Good house, and lease 12 years unexpired. Shop well fitted and stocked. For particulars apply to P. C., care of Messrs. Barron, Harveys & Co., Giltspur St., E.C.

A BUSINESS in same hands 9 years, previous 11 years. Owner having entered medical profession, and being in practice close at hand, would secure Dispensing and promote business. Good shop. Lease £200. If with practice to a Surgeon £350. Or Junior Assistant. Time for study. J. W. Draper, 59, Barnsbury Rd., London, N.

IMMEDIATELY.—Through death of proprietor.—A first-class Retail and Dispensing Business, situated in a North Lancashire town of 90,000 inhabitants. Established 40 years. Shop well situated in main street, roomy, and well appointed. Excellent opportunity for energetic man. Terms moderate and most favourable. Apply for further particulars, to C. Fryer, Esq., Solicitor, Winckley Sq., Preston.

BRISTOL. Dispensing, Prescribing and light Retail. Handsome and well fitted shop. Returns £12 a week, £5 profit after paying rent and taxes. Satisfactory reasons for disposal. Thorough investigation allowed. To an immediate cash purchaser £400. Apply, Chemist, 2, Freemantle Villas, Cotham Brow, Bristol.

BUSINESSES FOR DISPOSAL.

TWO Businesses. One established 17 years. Returns nearly £500. Second under management. 9 months' returns £14 per month, increasing. No opposition. House well adapted for letting. Hot and cold water bath. Good position. Main road, W. Price £350 and £200, or reasonable offer. Address, Aurum, 82, Westbourne Grove, W.

MIXED Retail and Prescribing Business in a favourite seaside resort in Wales. Double plate-glass front, with side entrance. Shop well fitted and stocked. Established 33 years. Full prices. Returns have exceeded £600. Rent £30. This is a splendid opportunity. Season now commencing. Price £250. Apply, Chemist, Medical Hall, Barmouth.

A PURE Drug Business in a seaport and manufacturing town in North Lancashire. Small price. Through ill health. Half value will be taken. Low rent. House can let off for nearly same. Address, E. D., Evans, Sons & Co., Hanover St., Liverpool. No cards. No agents.

IN a market town. A small Retail and Prescribing Business, returning between £300 and £400 a year. Full prices. A business man would find this a good opening, as he would have little or no opposition to contend with, and by personal supervision would greatly increase the trade. The business has been managed by Assistants for some years. Statim, care of Messrs. Barron, Harveys & Co., Giltspur St.

WANTED TO PURCHASE.

£1800 to £2300.—A thoroughly high class Dispensing Business, in healthy locality and with good residence. Returning from £1800 to £2300. Must be open to strict investigation. Send particulars of locality, returns, price, &c., to Emptor, care of Hodgkinsons & Co., 198, Upper Whitecross St., London. No agents.

GOOD class Dispensing Business.—Advertiser would be willing to manage a business for a short time with view to purchase. Suburbs of London or South Coast. No agents. Particulars to L. S., 42, Askew Rd., Shepherd's Bush.

TO CHEMISTS FITTING UP OR MAKING ALTERATIONS.

RANGE of 66 new mahogany dovetailed Drawers, 12ft. long, with gold labels and glass knobs, first-class make, price 2/6 per drawer. Range of 4 rows of Shelving and cornice to go over same (quite new), price 40/-. 1 second-hand panel Counter, painted mahogany, 16 drawers, various sizes and cupboard under, price 60/-. 1 second-hand Counter with mahogany front, 8ft. long, and return do., 6ft. long, price 90/-. 1 new mahogany Dispensing Screen, 7ft. 4in. long, with large handsome tablet, "Dispensing Department" in centre, price 130/-. 1 second-hand mahogany Desk and Glass Case, 2ft. long, price 27/6. 1 two-door second-hand mahogany Glass Case, 3-ft. long, price 30/-. 1 new pine Wall-case, stained mahogany and French polished, 6ft. long and 8½ft. high, price 150/-. 1 new mahogany Wall-case, 6ft. long, 8½ft. high, with bent-glass Case on bottom, part doors to lift up; this is a handsome fixture, price £15. Window enclosures, 6, 8, and 10ft. long, from 60/- each. Mahogany Stands for jars and globes, from 2/6 each. 2 new bent Tooth-brush Cases, 12-in long, glass shelf, mirror in back, bottom lined with crimson velvet, price 15/- each. 1 Soda Water Stand (second-hand), painted walnut, with new marble slab on top, price 35/-. Lot of 8-gal. globes (new), 15/- each. Illustrated List on application. Note.—All second-hand fittings are thoroughly renovated and re-French polished before being sent out. Richard Tomlinson, Druggists' Shop Fitter, and Dealer in Druggists' Sundries, 15, St. Paul's Sq., Birmingham.

VIZER'S

CHEMISTS' TRANSFER and ASSISTANTS' REGISTRATION AGENCY,

Victoria Chambers, 55, Chancery Lane, London.

MR. EDWIN B. VIZER, Pharmaceutical Chemist, having been engaged in the business for the last 36 years, in London and the provinces, is prepared to offer special advantages to gentlemen desiring to purchase or dispose of businesses.

The following businesses, among others, for sale:—

PETERBORO'.—Handsomely fitted Pharmacy. Price £600.

KENT.—Returns over £20 weekly. Price £460, on specially easy terms.

SURREY.—Corner premises. Returns £600. Price £470.

SOUTHPORT.—Returns £250. Price £210, or offer.

LONDON, W.—Prescribing "lock-up" BUSINESS. Price £350.

Gentlemen desiring to purchase, or to dispose of, businesses should send early particulars. No charge is made for registering such.

Information given to clients desiring to open new businesses, as eligible positions occur.

No charge to purchasers.

No charge to Vendors, unless a sale is effected.

N.B.—The want of a speedy and inexpensive means of communication between Employers and Assistants being a fact of daily experience, a special feature in this Agency is to supply that need by Systematic Registration and Correspondence. A uniform fee of 2s. 6d. is charged to cover expenses until suited. Early Registration is desirable.

Office hours 10 to 4, Saturdays 10 to 2.

Gentlemen desiring to purchase will oblige by sending particulars of requirements.

NEW CHEMISTS' TRANSFER AGENCY

416, STRAND, W.C., LONDON.

Mr. C. GLEDHILL begs to announce that during his journeys as Sundryman he has been so frequently requested to find successors and also consulted as to businesses that he has now commenced this business in conjunction with the Medical Agency of his brother, Dr. JAMES GLEDHILL.

Neatly fitted SHOP, in substantial London suburb. Returns £500. Rent £50. Price £450 cash.

Unopposed BUSINESS, in populous S.E. district. Returning £500 year. Post Office attached (£40 year). Rent £38. Price £350 cash.

Apply, Messrs. GLEDHILL, 416, STRAND, W.C.

TO BE LET.

A GOOD corner SHOP, recently fitted up with mahogany Counter, Shelves, and Drawers, gold labelled, glass knobs. Excellent chance for a young gentleman commencing business. No stock. Can have immediate possession. For particulars apply to Mr. JAMES FEAST, High St., Chatteris.

AUCTION ROOMS, 8, SEVEN SISTERS ROAD, HOLLOWAY.

MESSRS. DRIVER & PERFECT will sell by auction at their spacious rooms, as above, on Tuesday, June 24, at one o'clock, a large stock of Drugs, Patents, and Sundries. Catalogues on application to the Auctioneers. N.B.—Messrs. D. & P. are prepared to receive good lots of Fixtures, Drugs, and Sundries, particulars of which should be forwarded at once.

Messrs. TAYLOR & CO.

Chemists' Agents and Valuers,

WALBROOK CHAMBERS, 38, WALBROOK,

LONDON, E.C.

HAVE THE FOLLOWING BUSINESSES FOR DISPOSAL:—

1. KENT (within ten minutes' ride of town).—In an improving suburb. A good class light Retail and Dispensing BUSINESS. Returns between £7 and £8 a week, but capable of being much increased. Good profits. 8-roomed house. Rent £40. Price about £400. A capital chance for an energetic business man.
2. EASTERN COUNTIES.—Old established light Retail, Dispensing and PRESCRIBING. Returns £600 to £700. Gross profits £400. Good house, with large garden. Introduction given.
3. SURREY (near town).—Recently established good class BUSINESS. Returns average about £5 a week, at full prices. Handsomely fitted by Treble. Rent very low, on long lease. Good house. Death vacancy. No reasonable offer refused.
4. BRISTOL (improving suburb of).—Light Retail, Prescribing and DISPENSING. Returns now about £12 a week. Price £450.
5. LONDON, N.—Dispensing, light Retail and PRESCRIBING. Returns £830, at good profits. Price £760.
6. LONDON, S.W.—Good Retail, Dispensing, Prescribing and PROPRIETARY ARTICLES. Returns now £13 a week, at good prices. Shop stands in a splendid position for doing a large business. Price £440. A bargain.
7. LONDON, S.E.—Recently established BUSINESS, now returning at the rate of about £550 a year. Price £450.
8. LEEDS.—Returns £1000, under manager. Price £500.
9. ESSEX.—Recently established BUSINESS, with some Agricultural trade. Returns £550. Capable of being much increased. Illness cause of sale. Price £470.

T. & Co. have 298 other businesses in Town and Country for disposal. Gentlemen seeking investments are solicited to send particulars of their requirements.

No charge to purchasers.

T. & Co. keep a free Register of employers requiring assistants and assistants seeking situations.

HENRY GADD,

Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

97, FORE STREET, EXETER.

H. G. will be happy to furnish intending purchasers with particulars of Businesses from his Register. He has several to offer in Town and Country, to suit large or small capitalists.

Applications for either the sale or purchase of Businesses inserted in Register free of charge.

FOR SALE.

A 8ft. run of mahogany fronted Drawers, with glass knobs and gold labels, at 2/- per drawer. A 5ft., 6ft., and 7ft. plate-glass Counter Cases, as fig. A 18. A 6ft. Dispensing Screen, as fig. A 55, £5 10s. A 4ft. plate-glass Counter Case, as fig. A 10, £3. A iron Tincture Press, 10/-. A mahogany plate-glass Desk and Case, as fig. A 32. 2 doz. black Stock Bottles, 20/-; several doz. Shop Rounds, all very cheap. BYGRAVE, 12, Curzon Street, Wenlock Street, New North Road, Hoxton, London, N.

Midland Counties' Transfer Agency.

F. J. BRETT,

Trade Valuer and Auctioneer,

LEICESTER.

VALUATIONS.—It is essential, to prevent disappointment, that engagements should be made early.

Businesses thoroughly investigated for Buyers.

Purchasers have, at this agency, the advantage of about **300** Businesses to select from, requiring from £100 to £3000 capital. Valuations conducted for Probate and Fire Insurance.

BIRMINGHAM.—Good medium-class TRADE in suburb, returns, which are capable of much increase, about £500, price £300.

LEICESTER.—Mixed Retail, Prescribing and DISPENSING, returns £750 to £800, low rent, price £350.

STAFFS.—Profitable Prescribing TRADE, returns £550, price £300.

LANC.—Really genuine Family RETAIL, returns £900, price £700, good house.

MIDLANDS.—General Retail and AGRICULTURAL, in country market town, returns £1500, price £900.

LONDON.—Dispensing, good class Retail, and some DISPENSING, returns £800, price £850.

HANTS.—Returns recently £900, in good position, neglected through illness, now about £400, price £300.

SALE BY AUCTION.

F. J. BRETT, of Leicester, is instructed to Sell by Auction, in one lot, as a going concern, by Messrs. Gillett & Co., the Beswick Medical Hall, 82, Ashton New Rd., Beswick, Manchester. The trade is light Retail and Prescribing, and presents a favourable opportunity for investment. Sale Thursday, June 19th. Further particulars in future advertisements. Cards to view and all details at the Auctioneer's Offices, 23, Rutland Street, Leicester.

Transfers, Valuations and Auctions conducted throughout the United Kingdom by Mr. BRETT, Leicester.

Mr. EDMUND RUTTER

Arbitrator, Valuator & Chemists' Agent,

4, MELVILLE TERRACE, DEVONSHIRE ROAD, TURNHAM GREEN, W.

Member of the Pharmaceutical Society, and upwards of 30 years' experience. Prompt attention and advice given in all negotiations connected with vendor or purchaser.

MECHANICAL DENTISTRY.

PHARMACISTS practising Dentistry, not being able to undertake their own work, can receive practical instruction in all branches, together with board, &c., if desired. Fees moderate. Apply, Mr. BANNERMAN, Surgical and Mechanical Dentist, Derby Rd., Southport. High class work for the profession; charges strictly moderate.

WEST Bromwich District Hospital.—Tenders for supply of Drugs. Persons desirous of contracting for the supply of the above from July 1st, 1884, to December 31st, 1884, are requested to apply to me, the undersigned, for a form of "Tender" (no other will be received). It is requested that the Tenders be delivered "sealed" at my office not later than Monday, the 16th instant, and endorsed "Tender for Drugs." The Board of Management do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of deciding in case of dispute with regard to the quality of any article supplied. By order of the Board,

THOS. JONES, Secretary.

Board Room, May 31, 1884.

CHEMISTS' TRANSFERS.

32, LUDGATE HILL, LONDON.

MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

PURCHASERS who desire early information regarding eligible opportunities for entering business, will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

N.B.—No Charge to Purchasers.

MESSRS. ORRIDGE & CO. are instructed to transfer the following businesses, particulars of which, with order to view, may be obtained on application:—

1. LONDON, E.C. — Very old-established PHARMACY, situate in a business locality. Large foreign trade may be done. To a gentleman acquainted with German and French Pharmacy a good opportunity offers. The amount required is about £700. Valuation will be accepted.
2. LONDON, N.W.—Good class Dispensing and RETAIL. Returns £650 yearly. Several good Proprietary Articles attached, with an increasing sale. Shop double-fronted. Mahogany fittings, &c. Long beneficial lease. Price for the whole £650.
3. LONDON, W.C.—Returns at present £10 per week. Can easily be doubled by personal attention. Situate close to one of the largest hotels. Price about £400.
4. HERTS.—In a pretty locality. Retail and PRESCRIBING. Returns £400 yearly. Can easily be increased. Large shop and good house, with garden. Rent only £26 yearly. Price about £400.
5. Near BIRMINGHAM.—Unopposed country BUSINESS of good class. Returns £750. Large and convenient house. Price about £600, or offer.
6. SOMERSET.—First-class PHARMACY for disposal. Returns £900; increasing. All first class trade. Profits large. Good house (vendor's own). Well situated. Price about £850. Vendor is anxious for an early sale. Easy terms can be arranged. Worth attention.

SPECIAL NOTICE.

Messrs. ORRIDGE & Co. have several good class businesses for disposal, town or country, suitable for gentlemen with small capital. May be purchased on easy terms. Full particulars in confidence on application.

VALUATIONS.

Terms for valuation on application.

Appointments for June should be made as early as possible.

ORRIDGE & CO.

32, Ludgate Hill, E.C.

FLETCHERS' Concentrated Liquors.

Your attention is invited to the following Opinions of Pharmacists:

From **Messrs. MACKENZIE & Co., Dispensing Chemists,** EDINBURGH.

The **Concentrated Liquors** for making Syrups, which we have had from you, give us entire satisfaction. They are so convenient for retail chemists in dispensing, and so long as they are prepared with the same care and purity, they cannot fail to meet the increasing demand for chemical preparations in this form.

Yours truly
J. MacKenzie & Co

July 16, 1881.

From **Mr. A. G. RICKARBY, Pharmaceutical Chemist,** WALTON-ON-THE-NAZE.

Speaking from a practical point of view, I consider your **Concentrated Liquors** a perfect boon to provincial chemists, who are occasionally called upon to dispense prescriptions that have been previously dispensed by the large dispensing establishments in London, as they are thus enabled to vie with them in producing, without extra expense or trouble, fresh Syrups of uniform colour. Without your **Concentrated Liquors** I consider no provincial chemist's stock is complete.

Yours truly
Arthur G. Rickarby

November 9, 1883.

From **Mr. HORACE THOMAS, Pharmaceutical Chemist,** ST. LEONARD'S.

I have used several of your **Liquors** for the last twelve months with great satisfaction, having found them most useful, convenient, and economical. The loss from keeping some of the Syrups made, particularly those containing iron, used to be considerable—a loss which your Liquors have entirely removed; not to mention the great advantage of having the Syrups of a uniform colour.

Yours faithfully
Horace Thomas

July 9, 1881.

From **Mr. A. E. REMINGTON, Dispensing Chemist,** WELLINGTON, N.Z.

I have had the pleasure of trying your *Liq. Ferri Iodid.*, *Liq. Ferri Phosph.*, *Liq. Eastoni.*, *Liq. Tolut.*, and one or two others, and finding that to once use them creates a want, I should like to stock them on the most favourable terms to myself and introduce them to brother druggists. I may say that, on first reading your advertisements, I was sceptical as to the medicinal value of such **Concentrated Liquors**, but am happy to state that, having used them now for over twelve months, I am so convinced of their stability and reliability that I intend to make all my Syrups for the future with your Liquors.

Faithfully yours
A. E. Remington

September 7, 1883.

Trial Supplies free of cost on application to the Sole Manufacturers:

FLETCHER, FLETCHER & STEVENSON, Holloway, London, N.

London: Printed by WILLIAM INGLIS RICHARDSON, 4 and 5, Great Queen Street, Lincoln's Inn Fields, and Published by Messrs. J. and A. CHURCHILL, 11, New Burlington Street.

The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 729.] SATURDAY, JUNE 14, 1884. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain.

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 11 a.m., on the **second Tuesday** in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

Each Candidate must state at which of the following centres he desires to present himself:—

Aberdeen	Cheltenham	Inverness	Norwich
Birmingham	Darlington	Jersey	Nottingham
Brighton	Douglas, Isle of Man	Lancaster	Oxford
Bristol	Dundee	Leeds	Peterborough
Cambridge	Edinburgh	Lincoln	Sheffield
Canterbury	Exeter	Liverpool	Shrewsbury
Cardiff	Glasgow	London	Southampton
Carlisle	Guernsey	Manchester	Truro
Carmarthen	Hull	Newcastle	Worcester
Carnarvon		Northampton	York

Tuesday, June 24th, is the last day on which entries can be received for the next Examination.

INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, may be obtained from the Secretary, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

* A Certificate of having passed any of the examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hprs. free. 5 °/₀ discount if 20. Carriage paid.
HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER ..	11/-	Hpr.,	25 bots.
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PULLNA ..	18/-	Case,	20 bots.
,, ..	30/-	Case,	50 ½-bots
VICHY ..	31/-	,,	50 bots.
,, ...	27/-	,,	50 ½-bots.
CARLSBAD ..	37/-	,,	50 bots.
KISSENGEN ..	42/6	,,	50 ,,
SCHWALLBACH	27/6	,,	50 ,,
HOMBURG ..	40/-	,,	50 ,,
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BLOCK ICE.

Original Blocks, 2s. per Cwt.

Packing and Mats free.

Low quotations given for quantities taken from vessels while discharging.

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IMPORTER of ICE and MINERAL WATERS,

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ORANGE WINE

Prepared from fresh Fruit, and specially adapted for the preparation of Orange Quinine Wine.

ORANGE QUININE WINE

Containing the full quantity of Sulphate Quinine ordered in the British Pharmacopœia.

In Bottles (6 to gall.), 24s. per doz. Small Bottles, 10s. 6d. per doz.

HIRST, BROOKE & HIRST, LEEDS.

Since the introduction of Pepsine by BOUDAULT and Dr. L. CORVISART, BOUDAULT'S Preparations have been considered the most reliable.

BOUDAULT'S PEPSINE.

The Paris Hospitals have used no other.

PARIS, 1867. *HAVRE*, 1868. *LYONS*, 1872. *VIENNE*, 1873. *PHILADELPHIA*, 1877. *PARIS*, 1878.

Medaille Unique. *Medaille d'Argent.* *Medaille d'Or.* *Medaille de Merit.*

The Jury of the International Exhibition, Paris, 1867, awarded to BOUDAULT'S Preparations the *only* Medal given for Pepsine. Since that time it has taken the Medal at each of the International Exhibitions—Havre, Lyons, Vienna, Philadelphia, and Paris, 1878.

BOUDAULT'S PEPSINE—dose, 5 to 10 grains—in bottles, one ounce, 5/-; in bottles, half-an-ounce, 3/-
BOUDAULT'S PEPSINE WINE—dose, a tablespoonful—in bottles, 4/- and 8/-
BOUDAULT'S PEPSINE PILLS AND LOZENGES—dose, 2 to 4—in bottles, 3/3.

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CAN BE HAD OF ALL CHEMISTS.

"PURE WATER is only to be obtained from NATURAL SOURCES."

Vide LANCET, July 7, 1883.

The continually accumulating evidence that typhoid, diarrhœa, diphtheria, and the allied zymotic diseases and ailments are chiefly induced by the consumption of the ordinary drinking water supplied in town and country indicates the value to the medical profession of an absolutely pure natural mineral water which can be recommended with confidence for daily use.

APOLLINARIS NATURAL MINERAL WATER completely fulfils these conditions, as has been proved by the repeated examinations by the most illustrious chemists. Its entire freedom from all impurity, and its agreeable, refreshing, and digestive qualities have for many years secured its recognition and employment by the highest medical authorities as a valuable dietetic agent in daily use, and as a therapeutic in illness and during convalescence.

The MEMORANDUM of the LOCAL GOVERNMENT BOARD, July 13, 1883.

"*If any taint (however small) of infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of propagating disease.*"

The DAILY NEWS, July 19, 1883, says:

"*London is still supplied with drinking water from open streams exposed to choleraic infection.*"

ST. JAMES'S GAZETTE, Nov. 15, 1883

"*THE RECENT OUTBREAK OF DIPHTHERIA AT CANTERBURY.—An investigation by the sanitary inspector has revealed the fact that there are upwards of sixty polluted wells in the district in which the cases of disease occurred. In every instance the water was contaminated with sewage and swarmed with living organisms.*"

The LANCET says, June 30, 1883:

"*Water is the great carrier of the infective germs. It is the water to which we must look.*"

LANCET, September 15, 1883.

"*All parts of the Thames are polluted with human sewage. The whole Thames, in fact, is at all times polluted with unoxidised sewage matters.*"

REPORTS of the LOCAL GOVERNMENT BOARD.

"*Of 142 epidemics of typhoid fever observed in various localities, in 125 cases the epidemic had no other determining cause than the use of water containing impurities.*"

APOLLINARIS NATURAL MINERAL WATER

"THE QUEEN OF TABLE WATERS."

SOLE IMPORTERS: THE APOLLINARIS CO., LIMITED, LONDON.

NOTES ON RECENT DONATIONS TO THE MUSEUM OF THE PHARMACEUTICAL SOCIETY.

BY E. M. HOLMES, F.L.S.,
Curator of the Museum of the Pharmaceutical Society.

II.—ESSENCE OF LIMES FROM TRINIDAD.

In March last there was offered for sale in the London market some oil of limes which differed very considerably in flavour from previous consignments. A sample of this oil, presented to the Museum by Messrs. Wright, Layman and Umney, was so exceedingly fragrant and bore so strong a resemblance in colour and odour and taste to the finest or "perfumer's" essence of lemon that it was difficult to believe that it could have been obtained from limes. Under these circumstances, I asked Mr. J. O. Braithwaite to compare it with other commercial samples of the oils of lemons and limes, and he reported as follows:—

At 60° F.	Essential oil of limes, Trinidad.	Essentialoil of limes, commercial	Essentialoil of lemon, *α.*	Essentialoil of lemon. *β.*
Sp. gr. .	0·8741	0·8655	0·8566	0·8622
Boiling points .	177·7° C.	178° C.	175·5° C.	177° C.
		Colour test.		
Nitric acid .	Dark red-brown.	Brown.	Red brown.	Yellowish brown.
Nessler .	Canary-yellow.	Egg yellow.	Canary yellow.	Pale canary-yellow.
Phospho-ric acid	Deep umber.	Light red umber.	Umber.	Red brown.

"The solubility of the Trinidad oil is very different from that of commercial essence of lemon. It is soluble in the proportion of 1 part in 5 of alcohol of sp. gr. 0·838; so is commercial oil of limes.

"Commercial oil of lemon is barely soluble in the same menstruum in the proportion of 1 in 15.

"The taste of the Trinidad oil, while quite different from that of commercial oil of limes, has a slightly peculiar, but not unpleasant after-taste."

Being puzzled to know why an essential oil differing so much in flavour from ordinary oil of limes should be exported under that name, I made inquiries of Mr. H. Prestoe, the Director of the Botanical Gardens at Trinidad, who has sent the following interesting information:—

"Your remark that the odour of the oil is rather that of lemons than of limes is quite correct. It is to be observed that the odour of West Indian limes, as produced here, is rather that of lemons, as produced in Europe, than of limes produced there. The young shoots and all tender parts of the lime here have the odour of *Aloysia citriodora*,* the stronger lime odour being developed in the older parts. In the treatment of the fruit for obtaining the essence, the more rapid the process, the more pronounced is the lemon odour in the result if perfectly fresh fruits are used. The strong flavour of limes, more or less tinged with that of turpentine, seems to be a result of treating stale or decomposed fruit tissue. The plan adopted, on economic grounds, in Dominica and Montserrat, of crushing the limes as received from day to day and then, on the attainment of a large quantity of pulp, proceeding to boil down or distil, seems completely preventive of a fine flavour in the resulting essence when obtained. I might mention also that in some of our samples the essence has been obtained from lemons mixed with the limes, the two being grown on the same field and worked off by hand together. I may add that our limes are the finest in the West Indies, and are produced on trees quite unmatched for size and exuberance in any part known to me in the Western tropics."

The mystery is thus solved. If this product can be placed on the market at a price to compete with the Sicilian article and of quality such as the sample now in the Museum of this Society, there is every probability that it will soon come into demand for purposes of perfumery and culinary flavouring, etc., for which it is peculiarly fitted by its pure fragrance and great solubility in alcohol.

* I had inquired in my letter whether the oil was obtained from lemons or from the lemon-scented verbena (*Aloysia citriodora*).—E. M. H.

THE CHEMICAL PHARMACY OF THE NEW PHARMACOPÉE FRANÇAISE.

(*Continued from page* 987.)

Petroleum marks an entirely new departure in the chemical section of the Codex, and it is introduced under the general name of Pétrole d'Amérique. The different petroleums are a mixture of a great number of homologous hydrocarbons, varying in consistence, density, boiling point, and inflammability. Their products, which are themselves mixtures, are used in certain chemical and galenical preparations.

Essence de Pétrole blanche (light petroleum oil), is a colourless or slightly yellow liquid, non-fluorescent, of a peculiar penetrating odour resembling that of benzine. Density from 0·700 to 0·710. Distilling between 70° C. and 110° C. (158° F. and 230° F.)

This oil is insoluble in water, but completely miscible in absolute alcohol. Vapour ignites spontaneously at an ordinary temperature, with white, powerfully illuminating, sooty flame.

Huile de Pétrole Lampante (Huile minérale, H. pétro-solaire, Pétrole raffiné, Pétrole). — Colourless, often of an amber tint, blue by reflected light, of a less penetrating odour, and not unpleasant. Density not under 0·800, nor above 0·820. Distils at 150° C. (302° F.). This oil is insoluble in water and not miscible in absolute alcohol. Vapour not inflammable below 35° C. (95° F.). Extinguishes a lighted taper. Not coloured by an equal volume of pure concentrated sulphuric acid.

It is adulterated by other light and heavy petroleum oils.

Paraffine.—White crystalline substance, semi-transparent; slightly unctuous; extracted on cooling from heavy petroleum oils. Entirely devoid of smell and taste. Melts between 44° C. and 65° C. Distils between 280° C. and 400° C. Insoluble in water; sparingly soluble in boiling alcohol; freely soluble in ether, chloroform, bisulphuret of carbon, and the fixed and volatile oils. Density 0·875. A completely neutral body, resisting the action of acids and alkalies; heated with bromine a considerable quantity of hydrobromic acid is disengaged.

Pétroléine (Cosmoline, Graisse minérale; Pétréoline; Piméléine).—Petrolatum, better known under

thé accepted commercial term of vaseline. A mixture of heavy oils and paraffins more or less pure. Semi-solid, yellowish, unctuous. More or less fluorescent, specially when melted; without taste or smell, but with slight odour of petroleum when heated. Density between 0·835 and 0·860. Melts at 40° C. (104° F.). Distils at about 200° C. (392 F.). Insoluble in water and glycerine; sparingly soluble in boiling alcohol; readily so in ether, chloroform, bisulphuret of carbon, and in the fixed and volatile oils. A neutral body on which alkalies and acids have no action, cold; nor is it coloured by pure concentrated sulphuric acid. Entirely dissipated by heat. Vaseline is adulterated by fixed oils, fatty and resinous bodies.

Phénol (Acide Phénique).—Carbolic acid, itself official, is used in the preparation of a solution called

Phénol Sodé Dissous,
or solution of phenate of soda.

Carbolic acid	70.
Liquor sodæ (caustic)	100.
Aq. destillat.	q.s.

Dilute the caustic soda with about half its quantity of water, and the acid, and bring up the volume to 1 litre.

The solution is a novelty; the acid, not.

Phosphorus (white ordinary) and red phosphorus are both official. In preparing the phosphoric acid of pharmacy, the red substance is now employed, while the quantity of nitric acid has been increased. Phosphorus is directed to be kept under water, with the "essential precaution" that it should run no risk of being frozen.

White phosphorus, which is marked as *very poisonous*, is called normal; and red phosphorus, stated to be innocuous, constitutes Phosphore Amorphe. Phosphure de Zinc has been added, though the value of the preparation is not apparent; and a series of well-known alkaline phosphates presents no special interest.

The *Pyrophosphates* have survived the flight of time and certainly deserve a place in elegant pharmacy. They had a temporary reputation amongst ourselves, but have disappeared from medical practice. The Pyrophosphate de Fer Citro-Ammonical; and the Pyrophosphate de Soude (Sodæ Pyrophosphas) are unaltered; while the Pyrophosphate de Fer et de Soude (Pyrophosphas ferrico-sodicus) is new. The scale pyrophosphates make very attractive syrups.

Tannin (Acid Tannique, Acide Gallotannique) may claim to have had its pharmacy re-written. While Tannin Officinal is in the main unaltered, the process formerly given for its manufacture on a large scale has been omitted and two new preparations have been introduced.

Tannate de Quinine.

Quinine hydrate
Acid, acetic (1·060)
Acid, tannic. puv.

Quinia, mixed with water raised to the boiling point, is dissolved in sufficient acetic acid so as to make a feebly acid solution. On cooling, add by degrees to the liquor a filtered cold solution of tannin until the precipitate formed at the first is redissolved and neutralize exactly by sodium bicarbonate. The whole of the tannate of quinine is precipitated; it is collected on a filter, dried and finely powdered; then washed with distilled water, and dried a second time. The tannate is an amorphous, colourless salt, containing 20 to 21 per cent. of quinine.

Tannate de Pelletiérine.

Punica granatum (dried root bark)	1000 grams.
Quick lime	60 grams.
Chloroform (rectified commercial)	375 grams.
Sodium bicarbonate (powder) .	q.s.
Dilute sulphuric acid	q.s.
Liquor sodæ (caustic) 1·332 . .	10 grams.
Tannin, pure	q.s.

Slake the lime and make it into a thick milk; roughly bruise the bark; damp the powder with the milk of lime and place in a convenient vessel. Percolate with distilled water so as to have 2 litres of liquid. Shake this up with 250 grams of chloroform; let the mixture stand, and separate, by means of a funnel with tap, the chloroform which has dissolved the alkaloids set free by the lime. Shake the chloroform solution with 60 grams of distilled water, adding gradually a 10 per cent. solution of sulphuric acid until a slight acid reaction is produced. The alkaloids are thus converted into sulphates. Add powdered sodium bicarbonate in slight excess; two alkaloids destitute of tænifuge properties are thus set free, and on being agitated will pass again into the chloroform. Separate the latter and replace it by 125 grams of fresh chloroform, then add to the mixture 10 grams of caustic soda lye and well shake. This will isolate from their salts two tænifuge alkaloids, Pelletiérine and Isopelletiérine, which will disolve in the chloroform. Separate the latter and shake with 60 grams of distilled water, and $\frac{1}{10}$ sulphuric acid added gradually until a *very feeble* acid reaction is produced.

The two tænifuge alkaloids will remain as sulphates in the water. Put the solution in a porcelain capsule under a bell glass and expose for some days over concentrated sulphuric acid. The sulphates of pelletiérine and isopelletiérine will form a crystallized residue in the capsule.

The mixture of these two salts is called, for short, sulphate of pelletiérine.

To convert the sulphate into tannate, weigh and dissolve in distilled water, and add a solution of tannin containing 3 grams, 28 c.g. of tannin for each gram of sulphate; neutralize exactly by ammonia. Throw on a filter and wash the precipitate until the washings no longer cause turbidity in a solution of barium nitrate. Dry with gentle heat. When wanted for use, powder the prescribed quantity of tannate; suspend in fifty times its weight of water, and dissolve by a gradual addition of solution of tartaric acid with continual shaking.

The Tartrates do not call for notice. Those of Ammonio-Tartrate and Potassio-Tartrate of Iron have been deemed sufficient to replace the old Teinture de Mars tartarisée, the composition of which was variable and uncertain.

The Valerianates of Ammonia, Atropine, Quinine and Zinc present no novelty.

The adoption of a alphabetical arrangement in the new Codex, with its manifest advantages, has upset the old classification under distinct headings in separate chapters, rendering some amount of reference necessary to gain the full information respecting any particular substance. We have, therefore, no longer Les Alcalis Végétaux included in Chapter XVI. of 1866, or the Sels à Bases Végétales of Chapter XVIII. The general index, consequently,

rises into importance, and must be diligently consulted. In this section the Chlorhydrates have been extended, and even Chlorhydrate d'Ammoniaque, the Sal Ammoniac which is common to pharmacy, has been taken out of a mere official list and appears as a newly described chemical preparation.

Apomorphine, by reason of date, is a novelty. It is distinguished from morphine by its solubility in ether and chloroform. It gives a rose colour when treated with very dilute solution of perchloride of iron; readily oxidizable in the air; the product of this oxidation being soluble in water and alcohol. Apomorphine contains no water of crystallization, and should be completely soluble in chloroform without coloration. No process is given either for apomorphine or its chlorhydrate.

Morphine, on the other hand, has full details of manufacturing process added, with short processes for the Chlorhydrate de Morphine and the Sulfate de Morphine Neutre.

Aconitine in a crystalline form but retaining no water of crystallization is prepared by an altered formula. The preference given to the amorphous substance which was formerly stated to be much more active than crystalline aconitine appears to have been abandoned.

Azotate d'Aconitine (Nitrate of Aconitine) is made thus:—Powder crystallized aconitine; mix with about five times its weight of water, and exactly saturate with nitric acid previously diluted with five times its weight of water. Evaporate over the water-bath, and crystallize on cooling.

Two other nitrates are new introductions.

Azotate de Strychnine (Strychniæ nitras), the process for which is given as well as for Strychnine itself, and the extraction of the latter from Nux Vomica. It may be added that the method for the separation of Brucine is also detailed, and if we are to interpret literally the passage which declares that where a process of preparation has been appended, such products can or ought to be obtained by pharmaciens, we must allow that the requirements of French pharmaceutical chemistry are higher than our own.

Produits obtenus mean here clearly products obtained by home manufacture, distinguished from commercial products obtained from ordinary trade sources.

Azotate de Pilocarpine.—An entirely new nitrate, the process for its extraction from the leaves or bark of Jaborandi being given. The salt is purified by repeated crystallization in boiling alcohol. From this nitrate pilocarpine is prepared by the addition of ammonia up to alkaline reaction, and chloroform, which last dissolves the liberated alkaloid. The filtered chloroform solution is evaporated to a colourless syrup, which, to use the curious phrase of the Codex, "n'est autre chose que la pilocarpine." Chlorhydrate de Pilocarpine is the above dissolved in hydrochloric acid diluted with three times its volume of water; evaporate and crystallize.

It would be unfair to criticize French official chemistry by English notions; evidently special importance is attached both to Amorphous Digitalin, and to the Crystalline variety. Full details of process are given with respect to both; Digitalin in crystals has more than three pages devoted to its mode of preparation.

Digitaline Amorphe should always be used in a prescription where no particular kind is indicated. It is a white powder with a tinge of yellow, and possessed of an aromatic odour *sui generis*. Its essential character is stated to be the emerald green colour communicated on addition of hydrochloric acid. It is finally produced by spontaneous evaporation from chloroform, in accordance with the view entertained in 1866, that digitaline so purified was twice as active as that which had not undergone this treatment.

Digitaline Cristallisée is made from digitalis leaves "des Vosges," collected the second year at the flowering period. Chloroform is its best solvent; heated in contact with hydrochloric or phosphoric acid, it dissolves and the liquid assumes a fine emerald green coloration.

Atropine and its salts do not call for notice; and the same remark applies to Codéine, Santonine and Vératrine.

Caféine, Hyoscyamine, Narcéine and Vanilline are official and new introductions. Certain substances and preparations admit of no classification, and a reasonable surprise may be occasionally felt at their insertion. Acide Picrique (Carbazotic acid) is official; and so is Bitume de Judée (Asphalt.)

Cantharidine, with new process of extraction, is retained.

Picrotoxine has been promoted to a place of honour, as also Iodoforme. Dextrine, which we are used to class amongst commercial articles, is recognized in French chemical pharmacy.

The object of these sketches has been to give in convenient space some information concerning the preparations contained in the "Chemical Pharmacy of the New Pharmacopée Française," which are either novel or distinctive; where no real points of difference existed between French and English formulæ, reference has been omitted.

To assist the memory of the reader a few popular names are subjoined, which are sanctioned by common use.

Acide Azotique = Nitric acid.
Acide Phénique = Carbolic acid.
Alcali Volatil = Liquor ammoniæ.
Alcali Volatil Concret = Ammoniæ sesquicarbonas.
Bitume de Judée = Asphalt.
Blanc { d'Espagne / de Meudon / de Paris } = Carbonate of lime.
Calomel à la vapeur = Mercurous chloride.
Caméléon Violet = Potassium permanganate.
Camion = Vessel in unglazed earthenware, such as those in which benzoic acid or calcined magnesia is prepared.
Camphre du Japon = Camphora officinarum.
Céruse = Lead carbonate.
Colle de Flandre = Gelatine, or purified, Grénétine.
Cosmoline = Vaseline.
Couperose { Blanche = Zinci sulphas. / Bleue = Cupri sulphas. / Verte = Ferrous sulphate. }
Craie de Briançon = Talc.
Cristal minéral = Fused nitre.
Extrait de Saturne = Liq. plumbi diacetatis.
Goudron de Houille = Coal tar.
Karabé = Succin (ambre jaune).
Lessive des Savonniers = Caustic soda lye.
Liqueur des Cailloux = Solution of potassium silicate.
Liqueur de Labarraque = Solution of hypochloride of soda.
Magistère de Bismuth = Bismuthi subnitras.

MAGISTÈRE DE SOUFRE = Precipitated sulphur.
MERCURE DOUX = Calomel.
NOIR D'OS = Animal charcoal.
OFFICINAL. In Codex (Chemical section) = Prepared for pharmaceutical use.
PHOSPHORE AMORPHE = Red phosphorus.
POINTES DE PARIS = Ferri limatura.
SAFRAN DE MARS APERITIF. = Ferri subcarbonas.
SEL DE BERTHOLLET = Potassium chlorate.
SEL DE DUOBUS = Potassium sulphate. (K_2SO_4.)
SEL D'EPSOM DE LORRAINE = Common sulphate of soda. Purified = Glauber salt.
SEL GEMME = Commercial sodium chloride. Sea salt.
SEL DE NITRE = Potassium nitrate.
SEL D'OSEILLE = Binoxalate of potash.
SEL DE PHOSPHORE = Phosphate of soda and ammonia. (Phosphas ammonico-sodicus.)
SEL DE SATURNE = Diacetate of lead.
SEL DE SEDLITZ = Magnesium sulphate.
SEL DE SEIGNETTE = Sodæ potassio-tartras.
SEL DE SOUDE = Soda exsiccata (commercial).
SEL DE SOUDE CRISTALLISÉ = Carbonate of soda, crystals. ($Na_2CO_3 + 10H_2O$.)
SEL DE TARTRE = Carbonate of potash (pure). (K_2CO_3.)
SEL DE VICHY = Bicarbonate of soda.
SUCRE DE SATURNE = Diacetate of lead.

THE BITTER SUBSTANCE OF HOPS.*

BY DR. H. BUNGENER.

Little that is definite is known of the substance or substances to which the hop owes its bitterness. Lermer has succeeded, it is true, in separating from hops a crystallized colourless substance, insoluble in water, an alkaline solution of which has a marked bitter flavour, and which easily changes on exposure to the air, assuming a resinous form. According to Lermer, the formula of this substance is $C_{32}H_{50}O_7$; it possesses the properties of a weak acid and forms a characteristic copper salt, which is soluble in ether. This hop bitter is, however, produced from the hop by a very roundabout process, by treatment of the extract with alkalies; it is not therefore regarded by many as present in this form in the hop. and they hold that it is only produced by the action of the alkalies. On the other hand, however, Etti, by a complicated extracting process, but without using an alkali, succeeded in producing a bitter substance from hops, which is, however, soluble in water.

Several exporiments convinced me that there really existed in hops a crystallizable substance, insoluble in water, the alcoholic and alkaline solution of which had a bitter flavour, in short, which possessed all the properties of Lermer's hop-bitter acid. Petroleum ether is the best practical solvent in use for its isolation, as it does not dissolve the majority of the remaining constituents of the hop, especially the hop-resin, which they contain in considerable quantity. Still, the extraction of hop-bitter acid from hops is a troublesome and thankless job, the petroleum ether taking up certain substances which add greatly to the difficulty of purifying the crystals. On the other hand, we can readily and quickly attain our object, if we employ for our original material fresh lupuline from unsulphured hops.

The following process has furnished me the best results:—

The lupuline is first freed from gross impurities (hop-seed, leaves, etc.), and then covered with petroleum ether boiling at a low temperature (40° to 70°) in stoppered flasks. The mixture is shaken up from time to time. After twenty-four hours, by means of a Zullowsky filter immersed in the mass, and with the aid of a suction-pump, the dark brown solution is drawn off; then fresh ether is poured on to the lupuline and it is allowed to stand for another twenty-four hours. After this process has been three times repeated, nearly everything the petroleum will dissolve has probably been extracted. The solutions are put together and the petroleum ether distilled off *in vacuo* at a low temperature, until there remains in the flask a dark brown syrup, which on cooling solidifies into a crystalline mass. This is pulverized and turned on to a filter composed of a large funnel, in which a smaller funnel covered with muslin is inserted. With the aid of a suction-pump, the greater portion of the thick, crude solution can be filtered through. There remains on the filter a highly coloured crystalline "cake," which should be pulverized with a small quantity of petroleum ether and again filtered. After this operation has been repeated three or four times, we obtain an almost colourless mass, consisting of hop-bitter acid, contaminated by small quantities of a fatty substance and a substance which I could not isolate, and which I had at first great trouble in separating from the hop-bitter acid.

If we do not wish to utilize this crude substance at once, it will be necessary to melt it in the water-bath and pour it into a bottle under close seal, where it will at once crystallize and solidify. If it remains exposed to the atmosphere it will soon become sticky and turn partly into resin. Six kilos of lupuline, which included a large proportion of sand, furnished 400 grams of crude hop-bitter acid. The first experiments in crystallization with petroleum ether gave poor results; it is difficult to produce the acid pure in large quantities by this process, as a small quantity of the above substance obstinately clings to it, and it readily assumes a non-crystallizable form. Our object is more readily attained if we crystallize it once from alcohol, for which purpose we dissolve it in a little lukewarm alcohol, then quickly cool the solution; flakes of a fatty substance will be separated, which are removed by filtration with the aid of a suction-pump. Then we throw a few small crystals of the acid into the solution, and after a short time crystallization commences. As soon as it appears to be ended, the mother solution is removed with the aid of a platinum cone, and the crystals washed with a little cold alcohol. The alcoholic mother solution, which still contains the chief part of the bitter acid, must be quickly evaporated, and the residue consigned to a flask. The acid crystallized from the alcohol is then re-crystallized several times from petroleum-ether. In order to quickly dissolve the bitter substance, it should be carefully melted in a flask and double its volume of ether gradually added; on its cooling, we obtain beautiful prismatic crystals, which attain a length of 1 cm., and become perfectly pure after four or five crystallizations. The mother solutions must be speedily evaporated if we still wish to obtain crystals; after a time they will only furnish a resinous residue.

The hop-bitter acid melts at 92° to 93°. It is easily soluble in alcohol, ether, benzol, chloroform, sulphide of carbon, and vinegar; to a lesser extent in cold petroleum-ether, and not at all in water.

In the analysis I obtained figures which correspond best with those calculated from the formula $C_{25}H_{35}O_4$.

	Calculated.	Obtained.					
		2. Crystal.	3. Crystal.	5. Crystal.	6. Crystal.		
	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
C	75·19	74·79	74·83	74·9	75·04	75·05	75·07
H	8·77	8·97	8·90	8·85	8·87	8·83	8·80
O	16·04						

If we shake up the ether solution of bitter substance with an aqueous solution of acetate of copper, the ether will assume a green colour and gradually deposits a green crystalline powder, a cupreous combination of the bitter acid. It is difficult to obtain in a pure state, as the solutions are readily subject to slight decomposition, accompanied by a small deposit of copper oxide. This combination is readily soluble in alcohol, to a lesser extent in ether, and is insoluble in water.

* *The Brewers' Guardian, from the Zeit. f. d. gesammte Brauwesen.*

In the course of analysis, I obtained the following figures:—

C	69·4 per cent.	69·3 per cent.
H	7·95 „	7·98 „
Cu	7·20 „	7·18 „

If we suppose that the copper combines with two molecules of hop-bitter acid, by the decomposition of one of its atoms, H, we obtain the formula $C_{50}H_{68}O_8$ Cu. This combination will contain 69·87 per cent. C, 7·91 per cent. H, and 7·33 per cent. Cu. The figures obtained do not perfectly coincide with those calculated; it is nevertheless probable that the formula is correct, and the combined substance analysed was not perfectly true.

I have already referred to the fact that solutions of hop-bitter acid, if left standing too long, assume a yellow colour, and on evaporation leave only a yellow resinous residue. This, as its reaction shows, evinces a complete analogy with the crystallized acid. The dark-coloured mother solution, from which the crystalline cakes of bitter acid are obtained, contains a large proportion of this resinous compound, which can be isolated by treatment with a weak soda-lye; this substance, like the crystallized acid, is soluble in alkalies, and can be precipitated from an alkaline solution by an acid. Old hops furnish far less crystallizable acid than new hops; from some samples I have been able to obtain only a few crystals; the remainder had been transformed into the resinous modification.

If pure hop-bitter acid be pulverized and exposed to the atmosphere it soon turns yellow and the surface assumes a resinous consistency. At the same time, a more pronounced odour of fatty acids and aldehydes is apparent. Still more rapidly will this oxidation occur if a thin layer of an alcoholic solution of the acid is allowed to evaporate in the air. On the other hand, we can allow hop-oil to stand for days without its odour being perceptibly changed; it appears to me more than probable that the peculiar smell of old hops is due far more to the oxidization of the bitter substance than to the oxidation of oil.

Hop-bitter acid appears to possess the character of an aldehyde and of a weak acid; for the present I am not in a position to state its constitution more clearly. Most of the oxidizing processes have an energetic effect on it, forming also considerable quantities of valerianic acid.

The question as to whether the hop owes chiefly to this acid and its resinous modifications the property of imparting a pronounced bitter flavour to a solution, I must for the present leave unanswered. The acid and its isomer are both insoluble in water; they are, on the other hand, very readily dissolved in hop oil; they also furnish a tolerably bitter solution, if boiled for a long time in water, probably on account of their gradual decomposition. I will not for the present go further into the subject, as I hope soon to be in a position to give more definite information.

THE ECONOMIC APPLICATIONS OF SEAWEED.*

BY EDWARD C. C. STANFORD, F.C.S.

In 1862, twenty-two years ago, I had the honour of reading a paper before the Society of Arts, on this subject, in this room. The council marked their appreciation of that paper by awarding me a silver medal, and I cannot forget that the honours of that year were shared by another chemist, my friend, Dr. Crace Calvert, once so well known here, but who has since passed away. When, therefore, I was again invited a little while ago to read a second paper, I felt that some apology was due for not returning to report progress before. I am bound to admit that, like some wanderers through space, the period has been long and the orbit eccentric. For the former I must plead the difficulty of the subject; for the latter I must remind you that any one who follows seaweed must go to the wildest and most inaccessible shores.

It is extremely interesting to me, and I trust it may be made somewhat entertaining to you to look back on that paper, with the light of over twenty years' experience, and see how far the views then put forward were right, and how far they were wrong, premising that even failures are excellent lessons. "Many things have happened since then," and new and better sources have been discovered of many of the products then brought forward for the first time. As, however, it may be advisable to follow the lines of that paper, I shall first briefly allude to the uses of seaweed for food and for manure, and then speak more at length on the important application of these in the manufacture of kelp, and the production of iodine.

Seaweed as Food.—In this country little advance has been made in the use of the algæ as food. The algæ generally contain important nitrogenous constituents, and form nutritious articles of diet, but they have not been popular. We all like a "sniff of the briny," but we do not cultivate a taste for the internal consumption of our marine vegetables. We are equally guilty, however, in rejecting the majority of the fungi, so largely consumed as an important article of food on the Continent. The algæ are closely allied to these, but have the advantage of containing, as far as is known, no poisonous species. The algæ also contain a large proportion of salts which, however, are easily removed, if desirable.

Ulva latissima, or green laver, and *Porphyra laciniata*, or pink laver, are occasionally used in soups. *Rhodomenia palmata*, or dulse, is still sold in the streets of Edinburgh and Glasgow. *Aliara esculenta*, or murlins, is also eaten in Ireland. Some others are occasionally used, but, as a general food, the algæ are almost unknown. The sweetest species is the *Laminaria saccharina*, which is usually covered, when dry, with an efflorescence of mannite; a large quantity of this plant yielded me 7·47 per cent. of mannite. It appears to be a product of fermentation, and does not exist in the fresh plant. This plant is found only on sandy or gravelly shores.

The best known British species of the edible algæ is the *Chondrus crispus*, or Irish moss. This grows far down on the rocks, and is only uncovered at low spring tides. It is obtained mostly from the west coast of Ireland, and after being bleached by exposure to sun and rain, is largely exported to this country and to Germany. It is a gelatinous species, containing a principle known as carragheenin; it yielded me 63·7 per cent. of this substance.

The only other gelatinous British species is the *Gelideum corneum*. This is not very common, but it furnishes the import known as Japanese isinglass, of which it contains 50 per cent. This substance, known also as gelose, was first imported into France from China, in 1856; it has great gelatinizing power, much higher than any other material. It is not nitrogenous, and contains carbon 42·8, hydrogen 5·8, oxygen 51·4.

The following table shows the value of these species in making jelly. The melting point of the jelly is also appended.

1000 parts of water require of—

	Parts.	Proportion.	Melting point.
Gelose	4	1	90° Fahr.
Gelideum corneum.	8	2	90° „
Irish moss (*Chondrus crispus*)	30	75	80° „
Isinglass	32	8	70° „
Gelatine	32	8	60° „
Carragheenin. . .	36	9	70° „
Agar-agar (*Euchemia spinosa*)	60	15	90° „

It will be seen that gelose has eight times the gela-

* Read before the Applied Chemistry and Physics Section of the Society of Arts. Reprinted from the Journal.

tinizing power of isinglass and gelatine; but the melting-point of the jelly is too high to allow it to melt quickly in the mouth, hence gelatine is still the favourite.

The carragheenin has evidently become altered by evaporation. Gelose jelly keeps well, the others soon get mouldy. Although not fit for jelly, gelose may be valuable in the arts as a substitute for gelatine, which it so much exceeds in gelatinizing power. I would specially suggest its use as a substitute for gelatine in the production of instantaneous photographs.

The *Euchemia spinosa*, or agar-agar, is an Australian alga, and another important gelatinous species. The algæ form a large article of food consumption in China and Japan. Some years ago I procured some of these samples, one was a dark green frond, and the other two were cut up from it, about the size of vermicelli. I append the analyses of these and of a sample of our own laminaria from Loch Eport in North Uist.

Edible Seaweeds.—Japan.

	I.	II.	III.	IV.
Water	19·20	19·20	21·50	41·00
Volatile matter	59·50	48·20	49·70	32·29
Ash	21·30	32·60	28·80	26·71
Analysis of Ash.				
Soluble salts	74·18	74·85	61·81	72·50
Insoluble	9·84	5·21	33·68	18·69
Carbon	6·58	6·44	1·04	3·60
Silica	9·40	13·50	3·47	5·21
	100·00	100·00	100·00	100·00
Analysis of Salts.				
Potash	31·90	16·20	40·95	28·26
Carbonate soda	14·61	14·41	5·35	5·00
Sulphuric acid	9·58	8·99	12·33	13·34
Chlorine	39·28	27·52	44·74	51·74
Iodine	0·3171	—	—	0·2946

No. I.—"This is a good average sample, worth to-day, in this market, 11 taels, which, at 6*s.* 6*d.*, the average value of the tael, is 71*s.* 6*d.* per picul of 133 lbs.; therefore, one ton (16·75 piculs) would cost, in Shanghai, £57 4*s.* It can be cut finer, and then the price, if it is of the deep green which this is when it leaves me, would be about 14 taels per picul, or £72 10*s.* per ton."—*Extract from letters.*

The sample is green, and evenly cut about as fine as vermicelli.

No. II.—"This is the worst sample I can find, worth 2 taels, which is £11 8*s.* per ton. The uncut leaf would be more valuable than this if of the colour of No. I. It would fetch £16 per ton."—*Extract from same letters.*

This sample looks like the former deteriorated.

No. III.—This was apparently the uncut weed. It much resembles in colour and appearance No. IV.

No. IV.—Laminaria, cut in Loch Eport, North Uist; colour, dark green. Quotations by Mr. Frazer, Yokohama, September 18, 1868:—Fine cut, £17 9*s.* 8*d.*; fine brown, £15 10*s.* 9*d.*; large green, £9 14*s.* 2*d.*—per ton. Specimens of No. IV. were sent out to Yokohama, but they did not take the market. It is remarkable that so high a price as 72*s.* 6*d.* per cwt. (or nearly 8*d.* per lb.) should be realized there for this seaweed for dietetic purposes.

The taste for marine vegetables must be acquired, but those who have eaten them often are said to become very fond of them; and I have known some gentlemen in the Highlands, no mean judges of diet, who consider a dish of dulse, boiled in milk, the best of all vegetables. There is no doubt that a valuable food is lost in entirely neglecting the algæ; but I shall show, presently, how much of this may be recovered in an available form.

Seaweed as Manure.

This appears to me to be one of the worst applications of seaweed, and I do not think it has increased; farmers are beginning to find out that it seldom contains less than 80 per cent. of water, often more; and that for the actual manurial value in it, it may be very expensive if a long cartage is required. Four tons of water, at least, must be carted for every ton of dry manure, and when dried there is much additional expense, and it is very bulky. The dry weed contains an average of 2 per cent. of nitrogen, so that, as it is used, it contains less than ½ per cent. The chemical value is very little, except from the potash contained; but the mechanical value may be greater, as in covering root crops as a protection from frost, or where the soil is simply sand, and it binds it together. However, the cartage of water and the manufacture of soil are expensive amusements, and seaweed is not much used where there is high farming. It appears also, where continually used alone, to impoverish the soil; it is like feeding a dog on butter. The residue of seaweed ash, or kelp waste, one ton of which is equal to forty tons of wet seaweed, and contains all the phosphates, is quite unsaleable for manure in this country. It may be remarked, too, that in the wet climates of the west of Ireland, and of Scotland, where it is mostly used, the application of water is quite a superfluous operation for the farmer.

Another application of seaweed, which I mentioned before, was the manufacture of paper. As far as I know, this has only been carried out in France, on one plant, the *Zostera marina*, or grass wrack, a material largely used in this country for stuffing mattresses, and for packing light furniture. Some curious specimens of this plant, rolled up in little balls of fibre, were shown here at that meeting, as thrown up by the sea at Majorca and Minorca; and soon after it created a good deal of attention, having been proposed as a substitute for cotton; it contains little fibre, however. It grows in enormous fields, on sand-banks, and is widely distributed, and is to be found in almost every ocean; it is a pure marine plant, with flowers, having nothing in common with the algæ except the habitat. It is often found on the shore perfectly bleached. All the algæ are cellular, and contain no fibre, but properly treated they make a tough transparent paper, to which I shall have to allude presently.

The Manufacture of Kelp.

This crude substance which, for many years, made the Highland estates so very valuable, was at first made as the principal source of carbonate of soda. At the beginning of this century it realized £20 to £22 per ton, and the Hebrides alone produced 20,000 tons per annum. The importation of barilla then began, and for the twenty-two years ending 1822, the average price was £10 10*s.* The duty was then taken off barilla, and the price of kelp fell to £8 10*s.*; and in 1823, on the removal of the salt duty, it fell to £3; and in 1831, to £2. It was used up to 1845 in the soap and glass factories of Glasgow, for the soda. Large chemical works were then existing in the island of Barra, built by General McNeill, for the manufacture of soap from kelp, and a very large sum of money was lost there. Two tall octagonal chimneys were still standing not long ago, but have now succumbed to the gales. In the meantime, soda was being largely made by the Le Blanc process, and superseded kelp, which was always a most expensive source, yielding only about 4 per cent., often less than 1 per cent.; it must have cost the soap-makers what would be equal to £100 per ton for soda ash, the present price of which is £6.

The manufacture of iodine and potash salts then began to assume some importance, but the kelp required was not the same; that which contained the most soda containing the least iodine and potash. Chloride of potassium, the principal salt, was at one time worth £25 per ton. The discovery of the Stassfurt mineral speedily reduced

this price to about a third, and the further discovery of bromine in this mineral also reduced the price of that element from 38*s.* per lb. to 1*s.* 3*d.*, its present price. The amount of bromine in kelp is small, about a tenth of the iodine, and not now worth extracting. Large quantities are now produced in Germany and America. More recently, the manufacture of iodine from the caliche in Peru has attained large proportions, and has so far reduced the price of that article, as to make its manufacture from kelp unremunerative. In a paper, compiled for the British Association, published in 1877, I estimated the then total production of iodine in Great Britain and France at 2000 kegs of 1 cwt. each; and the future production of Peru at 6000 kegs; an estimate which is now being rapidly realized.

In 1882, the amount of iodine exported from Peru was 205,800 kilos, or 4116 kegs, divided as follows:—

To London	120,900 kilos
„ Hamburg	62,100 „
„ New York	22,800 „
	205,800 „

The present annual output is estimated at 300,000 kilos, or 6000 kegs.

On the other hand, the present manufacture of Great Britain and France is less than 1000 kegs, the production of France being now reduced to almost nothing, and the kelp sold as manure.

I append an abstract of a table in that paper, showing the imports of kelp into Glasgow, to which city or its districts the manufacture of British iodine has always been confined.

The prices given are the average prices for the year; higher than the maximum, but not lower than the minimum, have been reached. It is remarkable that we are now coming back to exactly the price of 1841, forty-three years ago, and also exactly to the price of twenty-two years ago, when my first paper was written. Potash salts, however, were then three times the present price.

Imports of Kelp into Clyde.

Five years, 1841 to 1845.

Tons of kelp, 1887 in 1844 to 6086 in 1845; average 3133. Price of iodine per lb., 4*s.* 8*d.* in 1842 to 31*s.* 1*d.* in 1845; average 11*s.* 9*d.*

Ten years, 1846 to 1855.

Tons of kelp, 3627 in 1846 to 11,421 in 1850; average 3627. Price of iodine per lb., 8*s.* 8*d.* in 1851 to 21*s.* 3*d.* in 1846; average 12*s.* 11*d.*

Ten years, 1856 to 1865.

Tons of kelp, 6349 in 1856 to 14,028 in 1863; average 9730. Price of iodine per lb., 5*s.* in 1863 to 13*s.* 8*d.* in 1856; average 8*s.* 10*d.*

Ten years, 1866 to 1875.

Tons of kelp, 8116 in 1868 to 10,923 in 1874; average 9187. Price of iodine per lb., 10*s.* in 1866 to 34*s*, in 1872; average 15*s.* 11*d.*

Seven years, 1876 to 1883.

Tons of kelp, about 6000 to 8000; average about 7000. Price of iodine, 5*s.* in 1883 to 15*s.* 6*d.* in 1879; average about 10*s.* 2*d.*

Total average kelp import, 1841 to 1883 (42 years) 6750 tons. Average price of iodine per lb., 12*s.*

So that the present price is only about 40 per cent. of the average value. The great fluctuation in the price, and the small bulk of the article in proportion to its value, and the limited production, have led to great speculation, and I have no doubt a few kegs might still be found here and there in London which were bought some years ago at a pretty high price, and are still waiting the improbability of a turn in the market.

The amount of iodine in sea water is so minute, that it is extremely difficult to detect by ordinary tests. By evaporating down two portions of sea water filtered and unfiltered, each over 14 gallons, and by employing a delicate colour test, I have succeeded in estimating it. The sea water was collected carefully in the Atlantic, west of the island of Tyree. I found in 1,000,000 grs. measure (14·2857 gallons) of unfiltered sea water, ·003572 or 1 in 280,000,000; in 1,000,000 grs. measure of filtered sea water ·003442 or 1 in 291,000,000. The unfiltered water might be expected to contain more iodine from minute algæ in suspension, although it appeared clear. Kortstoffer, who estimated it in the Mediterranean, puts it at 1 part in 50,000,000. Bromine is easily detected; sea water generally contains about 6 parts in 100,000, and of chlorine about 2 per cent. Professor Dittmar, who has been working out the sea water samples of the *Challenger* expedition, has discovered a remarkable relation between this element and that of the chlorine which he has kindly communicated to me. He finds the relation in the great number of samples examined (77) to be constant in the proportion of ·340 bromine to 100 chlorine. He finds the average amount of chlorine to be 1·9 per cent., or 19,000 parts in 1,000,000, and of bromine ·00646 per cent., or 64·6 parts in 1,000,000, or 18,422 times as much as my mean result for the iodine. The Woodal Spa has been long known to be very rich in iodine and bromine; a recent analysis by Wright giving of chlorine 11113·73 parts per million, bromine 49·7 parts per million, iodine 5·21 parts per million. Here the relation of bromine to chlorine is ·44 to 100, and the iodine about a tenth of the bromine; in sea water the proportion of iodine is a very minute fraction of this. Examination of the brine and the mother liquor from the salt mines of Cheshire failed to detect iodine. The algæ possess the power of assimilating the iodine to about ten times the extent of the bromine. I append estimates of iodine in a number of algæ, those of the Laminaria and Fuci are the average of a great number of specimens collected at different times of the year, and all round Great Britain and Ireland, the Channel Islands, and the Isle of Man, and including Orkney and Shetland, Iceland, Denmark, and Norway. I append also estimates of the iodine in several of the giant algæ in the Falkland Islands, for which I am indebted to Governor Kerr, and Mr. F. G. Cobb, of the Falkland Islands Company.

These gigantic species are seen in this country for the first time in the fresh state, and little is known about them. The macrocystis is said to grow to a length of 1500 feet, or over a quarter of a mile in length. It grows in 10 fathoms water in Stanley Harbour.

The *d'Urvillea* forms stems branched like trees, 12 feet or 14 feet long, and a foot in diameter. All these weeds are thrown up in enormous quantities on the shores of the Falkland Islands, and along the Straits of Magellan, making it difficult for a boat to approach them.

Dry Weeds.

	Per cent.	Lbs. per ton.
Laminaria digitata, tangle stem . .	0·4535	10·158
„ „ Bardarrig frond .	0·2946	6·599
„ stenophylla stem . . .	0·4028	9·021
„ „ fond . . .	0·4777	10·702
„ saccharina, sugar wrack .	9·2794	6·258
„ bulbosa	0·1966	4·403
Fucus serratus, black wrack . . .	0·0856	1 807
„ nodosus, knobbed wrack . .	0·0572	1·281
„ vesiculosus, bladder wrack .	0·0297	·665
Halidrys siliquosa, sea oak	0·2131	4·773
Hymanthalia lorea, sea laces . . .	0·0892	1·998
Rhodomenia palmata, dulse	0·7120	1·594
Japanese edible seaweed	0·3171	7·102
Zostera marina, nat. order Zosteraceæ	0·0457	1·023
Rhodomela pinnastriodes	0·0378	·468
Chordaria flagelliformis	0·2810	6·294
Chorda filum, sea twine	0·1200	2·688
Chondrus crispus, Irish moss . . .	Trace	—
Enteromorpha compressa, sea grass .	Nil	—
Gelideum corneum, Japan	Trace	—
„ „ Cornwall . . .	„	—
Euchemia inosa (agar-agar) . .	Nil	—

Falkland Islands Giant Algæ.

	Per cent.	Lbs. per ton.
D'Urvillea utilis, No. 1	0·0075	·179
„ „ No. 2	Trace	—
Lessonia . . . No. 1	0·0284	·636
„ No. 2	0·0181	·405
Macrocystis pyrifera	0·0308	·690

In the foregoing table the Laminariæ and the Fuci are the kelp-producing species.

It is remarkable that the three gelatinous species, *Chondrus*, *Gilideum* and *Euchemia*, contain little or no iodine.

It is noticeable, too, that the *Enteromorpha*, or sea grass, a plant which retains, when dry, a very strong odour of the sea, contains no iodine.

It is also remarkable that the giant algæ contain so little iodine, growing outside the influence of the Gulf Stream, which, rightly or wrongly, has been supposed to be the iodine carrier. It is a curious fact that there are certain seeds, supposed by the natives to grow on the tangle, and called "tangle nuts." A specimen here from Tyree is evidently the seed of a leguminous American tree, brought over by the Gulf Stream.

It is probable that all animal substances from the sea contain iodine; its presence has been long known in cod-liver oil, a substance supposed to be rich in it, and to owe most of its valuable medicinal property to it, but I found, after investigating a good many various specimens of this oil, that the amount is infinitesimal. The liver itself contains double as much. Oysters, especially the Portuguese variety, have also been said to contain a good deal. The following are my results:—

	Per cent.
Cod liver oil, average of six specimens	·000322
Cod liver, fresh	·000817
Salt cod fish · 48·5 per cent. water	·000255
Salt ling fish . 50·25 „ „	·000150
Fresh cod fish . 80·7 „ „	·000160
Scotch herring, salt	·000650
Scotch herring, brine	·000120
Oysters, Portuguese	·000040
Whale oil	·000100
Seal oil	·000050

(*To be continued.*)

VESICATING AND PURGATIVE PRINCIPLES OF CROTON OIL.*

BY R. H. SMILEY.

This is the subject of a paper by Mr. Harold Senier (*Pharmaceutical Journal and Transactions*, December, in which he gives results of his investigations.

To verify his results, I have made numerous experiments, both as to the separation and the action of the parts when separated.

Mr. Senier states that croton oil is soluble in alcohol, by taking equal volumes of each, or less proportion of alcohol; but when more alcohol was added a separation occurred, one part of which was entirely non-soluble, and was found to contain the purgative principle of the oil, whilst the part which was soluble contained the vesicating part. With a sample of croton oil I first made experiments as to its solubility, and found that by taking 10 minims of oil and 5 minims of alcohol a perfect solution occurred after slightly heating; but taking 10 minims of alcohol and 5 minims of oil a separation into two parts remained unchanged by the same amount and even more heat than made a solution of the other proportion. I next put a quantity into a test tube, and added more than equal volumes of alcohol, and after shaking and allowing to stand for a while the soluble part, which, being the lighter, at once rises to the top, was decanted into another vessel. This washing with alcohol was continued until all the soluble part was removed, which was shown by the alcohol, after shaking, rising to the top colourless.

The liquid part removed from the non-soluble was applied to the skin in several places, and in due time a pustular eruption showed, as might be expected, by the external application of croton oil. I then tried some of the insoluble part in the same way, and no sign of any eruption whatever appeared. I made pills of the non-soluble part, and let each one represent ¼ of a minim, and began by taking the half of one pill, which produced no effect other than slight nausea. The dose was increased gradually, and resulted about the same as experiments made by Dr. John W. Meek, of London, who used some of the non-soluble part of the oil prepared by Senier. I found that ½ minim of the isolated part acted as a pretty strong purgative, and the first action generally occurred in from twenty minutes to one hour from time of taking. The action of the vesicant and purgative parts was further verified by experiments on others, and the general result was about the same as given above. There was no griping in any case, and the most unpleasant symptom of the action was slight nausea, which was no more than one would expect from any purgative dose of medicine.

Croton oil will, in the future, be more useful as a remedy than it has been in the past, especially as to internal administration, which has heretofore been accompanied with very unpleasant effects on account of the vesicant principle, but this evil being now removed the good results of the purgative principle are ready for investigation.

* From the *Weekly Medical Review*. Reprinted from the *St. Louis Druggist*, April 26, 1884.

BARBADOES ALOES IN ST. HELENA.

In a recent report on the Island of St. Helena, Mr. Morris, of the Royal Botanic Gardens, Jamaica, says:—

"Another member of the aloe family, which is very abundant in the island, and capable of being largely utilized, is the Barbadoes aloe (*Aloe vulgaris*). It grows freely in Jamestown Valley in volcanic ash, and on barren rocks. It is fast spreading also in Rupert's Valley; and I noticed it was there used, and seemed to flourish, as a coping for a stone wall.

"This plant, so hardy and prolific, produces the aloes of medicine, and it is cultivated, especially at Barbadoes in the West Indies, solely for this purpose. It reproduces itself by means of suckers around the stem; these being removed when about six inches high are planted out on waste pieces of land, about two feet apart. When fully grown, and just before flowering, the outer and older leaves are first removed; they contain an abundance of a thick yellowish juice, which is allowed to drain into troughs leading into a large iron pot or caldron. When the pot is nearly filled it is placed over a fire, and the juice boiled until it has attained the consistency of thick glue; this when cool is the aloes of commerce, and it is usually exported to England in bottles or gourds.

"Barbadoes aloes, prepared in the manner above indicated, is valued in the London market at £4 to £8 per cwt. It is usually retailed by druggists at 4*s*. 6*d*. per pound. This industry, which necessarily must be very small, might commend itself to the notice of many people, especially fishermen and others, living in the lower valleys. The plant is abundant; its cultivation, if merely putting a few suckers in the ground can be so called, is of the simplest description; and the preparation of the juice requires only a few troughs, made by nailing a couple of pieces of board at right angles to each other, and an iron pot. If some local tradesmen were to give attention to the subject, and undertake to purchase the manufactured aloes from the cultivators in small quantities, the industry would soon be placed upon a satisfactory footing."

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THE ROYAL COMMISSION ON TECHNICAL INSTRUCTION.

THE preliminary volumes of the Second Report of the Royal Commissioners who were appointed, about two years since, to inquire into the instruction of the industrial classes of certain foreign countries in technical subjects, and the influence of such instruction upon manufacturing and other industries, have just been issued. They contain a large amount of valuable information respecting technical education on the Continent and in the United States, as well as observations made during visits to various industrial establishments, together with the conclusions to which the Commissioners have come after careful consideration of what they have seen abroad and comparison with the conditions that prevail in Great Britain. The Report is one that is worth careful pondering in this country, for whilst there is enough in it to confirm our national egotism, there are also plenty of facts which should act as monitions that if Great Britain intends to continue at the head of industrial nations she must bestir herself and equip her sons in the best possible manner for the struggle. Indeed the Commissioners confess that although the display of continental manufactures at the Paris Exhibition had led them to expect great progress, they were not prepared to find so remarkable a development of natural resources and such perfection in industrial establishments as were actually met with in France, Germany, Belgium and Switzerland. Indeed, in some branches of industry, more especially in those requiring an intimate acquaintance with organic chemistry, Germany has already taken the lead. Two years ago, Professor ROSCOE publicly expressed his regret that the rough products of coal tar were exported from this country to Germany and re-imported in the form of products of greatly enhanced value. In Belgium, the introduction by SOLVAY of the ammonia process for the manufacture of soda has struck a heavy blow at our previous pre-eminence in the alkali manufacture. Moreover, in the economical production of coke, and the recovery of the tar and ammonia formed in this process, we are only now slowly following in the footsteps of our continental neighbours. On the other hand, the Commissioners point out that most of the principal new industrial departures of modern times have been due to the inventive power and practical skill of our countrymen. For instance, it is to the invention of BESSEMER, either alone or in conjunction with the modifications introduced by THOMAS and GILCHRIST, that the present enormous production of steel at one-tenth of its former cost is due; the processes of WELDON, HARGREAVES and DEACON have revolutionized the alkali trade; and the manufacture of aniline dyes owes much to the initiative of PERKIN.

Of course it would be impracticable in these columns even to glance at a tithe of the numerous topics referred to in the Report; we must content ourselves with indicating briefly the explanation that appears to be favoured by the Commissioners of the wonderful advance that has been made by our neighbours, especially in those industries that may be supposed to present special points of interest to the readers of this Journal. Contrary to what might be expected, the Commissioners do not find this explanation in the resources of continental countries for the technical education of workmen outside of the workshop, which are said to be very much more limited than has hitherto been supposed in this country to be the case. It is true that in many important centres there are societies, supported mainly by the manufacturers of the district, having for their object the promotion of education among workmen by means of lectures and the establishment of schools and museums of technology. But although these societies are numerous their sphere of action is limited, and the Commissioners consider that the facilities they offer for evening instruction in science and technology are inferior to those which are at the disposal of our own workmen. There are also technical schools for boys aspiring to become foremen; but it was found that, although, a few of the foreign foreman met with had received theoretical technical instruction, this was not generally the case, and the majority of them were, as in this country, men who by superior steadiness, intelligence and capability for management had raised themselves from the position of ordinary workmen. Nevertheless the Commissioners do not ignore the value of such instruction to the rank and file of mechanics, as is shown by their recommendations framed to secure a more sound and thorough teaching of science, drawing, and the use of tools, even in our primary schools. They forcibly argue that as it is from the great mass of the working population, who have to begin earning a livelihood at an early age, that most foremen will probably continue to be selected, it is even more essential for them than for the community in general that instruction in the rudiments of the sciences bearing upon the industrial arts should form a part of the curriculum of elementary schools. But it is to the technical high schools —such as the Ecole Centrale of Paris and the Polytechnic Schools of Germany and Switzerland—that the Commissioners are disposed to attribute the

success that has attended the foundation of various large manufacturing industries on the Continent, and they are of opinion that the success would not have been achieved to its full extent had it not been for the system of high technical instruction in these schools, and for the facilities they afford for carrying on the thorough study of those sciences which bear upon industrial art.. These schools are the recognized channel for the instruction of persons who are inteuding to become the technical directors of industrial establishments, but the German uuiversities also share largely in the training of technical chemists.

The consequence is that the Commissioners have been much impressed with the general intelligence and technical knowledge of the masters and managers of industrial establishments on the Continent. They state that they have found them, as a rule, possessed of a sound knowledge of the sciences upon which their industries depend, familiar with every new scientific discovery of importance and able to appreciate any possible application of it to their special purposes. Thanks also to their knowledge of foreign languages and of the conditions of manufacture prevalent elsewhere they are ready to adopt not only the inventions and improvements made in their own country, but also those of the world at large. Hence the working of their establishments presents a marked contrast to the "rule of thumb" which too often obtains, for instance, in chemical works in this country. Even in respect to the alkali industry, whilst the Commissioners admit that some English makers are as good alkali makers and just as well acquainted with the scientific bearings and relations of their own manufacture as their continental rivals, they consider that the continental alkali makers are men of wider knowledge and of more extended scientific attainments. Thus it is thought that whilst probably none of our English alkali makers could discuss the chemistry of the latest organic colouring matter, nearly all the continental masters are competent to do so. The extent to which the scientific spirit pervades large industrial undertakings on the Continent is illustrated by what the Commissioners saw in their visit to a coal-tar colour works at Basle, which is by no means the largest of its kind. At the head there was a "scientific director," who was a thoroughly educated chemist, and under him, in charge of the main departments, there were three "head chemists," each of whom had been trained in the Zurich Polytechnique, and below them were a number of "assistant chemists," similarly educated. These chemists carried on their investigations respecting the productions of new colouring matters, or the more economical manufacture of old ones, in ten well-equipped experimental laboratories, which were supplemented by a large scientific library. We may refer more in detail on a future occasion to the progress that has been made under these conditions; but it will be apparent that the unfortunate departure of the coal-tar colour industry from this land would require little further explanation. The principal lesson to be drawn from the Report—aud one not without its bearing upon the subject of the proper training of the pharmacist—appears to be that a thorough and sound scientific and technical training will be an essential preliminary in the future to the successful carrying on of any great industry. The Commissioners fear that the belief in the efficacy of training of this highest character is at present smal in England, although, as they point out, there is no country in which so many abstract investigations have been undertaken that have been afterwards turned to practical account. Still even in England some advance is being made; in many large factories the skilled chemist is already a part of the regular staff, and it may be hoped that the work of the present Commission, the appointment of which was really the expression of a healthier state of public opinion on the subject, may help to add to those qualities which have enabled our countrymen hitherto to keep in the front ranks that amount of scientific knowledge which is indispensable to the intelligent carrying on of their industries.

CINCHONA CULTIVATION IN CEYLON.

In the Annual Report by Dr. Trimen on the Royal Botanic Gardens in Ceylon for the year 1883, he quite confirms a statement that we quoted a few months since as to the unsatisfactory outlook for the once promising and extensive experiment in the cultivation of cinchona by private persons in that island. The interests involved may be estimated from the fact that the export from Ceylon during the last commercial year amounted to nearly seven million pounds of bark. But there has been a large decrease in the number of cinchona plants and Dr. Trimen at the time of writing his report anticipated that the large export would not be maintained, whilst a fear is expressed that a large proportion that had been exported "was very poor stuff," which at the prices then prevailing could hardly have been worth sending home. It is estimated that at the end of the year there were probably 128,000,000 of cinchona plants in Ceylon, of which not more than 22,000,000 were over two years old, and it is thought that the proportion of the other 122,000,000 which would grow up to maturity would prove to be very small. The heavy mortality of seedlings and young trees now experienced in the island has caused much disappointment, and is said by planters to exceed that which obtained formerly. The cause of this mortality has been assumed to lie in a "degeneration" of the cinchonas since their cultivation in Ceylon, each generation being supposed to be inferior in vitality to the one that preceded it. But Dr. Trimen does not see any clear evidence of this, as, under similar conditions, the tendency to die at an early age is as marked in

plants grown from seed fresh from South America or the West Indies as in those from Ceylon-grown seed. He considers the cause is to be sought rather in the climate and soil of Ceylon. Much of the shallow soil and cold subsoil and many of the wet, windy and exposed hill sides have proved very unsuitable for cinchona as a permanent cultivation; but in well-protected localities, with a deep soil and good drainage, it is thought probable the plant grows as well now as it ever did in Ceylon. But even under the favourable conditions that might be supposed to be present in the experimental plantations in the Government gardens, the experience cannot be said to be promising, for the manager at Hakgala reports that the plants were dying there at such a rate as to necessitate special replanting, and that although there had since been some improvement, hardly a plant had made satisfactory growth, whilst those of the calisaya class had nearly all died.

The second reading of the Medical Acts Amendment Bill in the House of Commons is set down as the fourteenth order of the day for Thursday. As, however, the Bill is "blocked" by Messrs. Warton and Biggar, there is little doubt that it will again have to be postponed.

* * *

We are requested by the Curator to state that he is desirous of making the Herbarium of British plants belonging to the Museum of the Pharmaceutical Society as complete as possible. He will, therefore, be glad to receive one or two well-dried characteristic specimens of local species or of any of the varieties or forms of critical species. The Curator hopes thus to make the Herbarium valuable for reference to those who will compete for the prizes of the Society, and for those members of the Society who are interested in compiling local floras.

* * *

The *Bulletin Commercial* reports a serious explosion at Constaninople during the preparation of oxygen, which furnishes a fresh demonstration of the necessity that exists for verifying the chemicals used in this operation. It appears that the operator, M. Aliprandi, a pharmacist, having run out of binoxide of manganese, sent for a supply to another pharmacist, M. Alekian, and placed about 125 grams of this material together with an equal quantity of potassium chlorate in a Limousin apparatus made of steel. Having observed that after heat had been applied for two minutes not a bubble of gas had passed through the wash bottle, M. Aliprandi became apprehensive and had barely escaped from the room before an explosion took place, which did a considerable amount of damage. Upon examining the remaining portion of the black powder that had been received as binoxide of manganese it was found to consist entirely of sulphide of antimony. Some question appears to have arisen as to the person upon whom the responsibility for the consequences of supplying one article for another lies, and it is suggested that M. Aliprandi has a remedy against M. Alekian, who also can recover from the French house by whom he was supplied. But it does not appear to us that the question can be settled quite so simply, for if M. Alekian incurred a responsibility by receiving an article into stock without examination, a similar responsibility would lie upon M. Aliprandi himself, who was equally negligent.

* * *

At the meeting of the British Medical Association in Belfast, which is to commence on the 29th inst., there is to be a debate on Indian Drugs in the section devoted to Pharmacology and Therapeutics, which promises to be one of the features of the gathering. On the other hand in the International Medical Congress to commence in Copenhagen on the 10th of August, there is to be no special section for Materia Medica, as it will be remembered there was in the similar Congress in London, and this is described by a medical contemporary as "a most wise decision."

* * *

The Third Annual Meeting of the British Association of Inspectors of Weights and Measures is to be held in Glasgow, in the Christian Institute, on Tuesday and Wednesday, the 24th and 25th of June. Amongst the business that will come before the Association, it is announced that at 1.30, on Tuesday, a paper, by Mr. Shaw, of Edinburgh, will be read, entitled, "Observations on the Weights and Measures of Apothecaries and the Necessity existing for Exactness in Comparing and Verifying the Same." On Wednesday morning, at 10 o'clock, Mr. Gillman, of Leeds, is to read a paper entitled, "A Consideration of the Scientific Laws relating to the Operation of Weighing and to Weighing Apparatus."

* * *

We have received from the Postmaster-General a copy of a notice calling attention to the desirability that bottles containing liquids, intended for transmission by the Parcels Post, should always be firmly packed in tin or wooden boxes, well stuffed with a soft material, special attention being given to the packing round the shoulders of the bottles. Some of the prepared papers specially introduced for the purpose are spoken of as very suitable. When more than one bottle is sent in a parcel, each bottle should be separately wrapped and a wooden division placed between the bottles.

* * *

The luxuriant manner in which many garden plants flourish in the island of St. Helena has suggested the possibility of cultivating flowers there for the sake of extracting the perfume. One difficulty has hitherto been the want of a simple and inexpensive apparatus for the purpose of the extraction, but there now seems to be some probability that it will be overcome. The island was formerly quite a lemon garden, so that many localities bear names associated with the plant, and the lime was also plentiful; but the neglect to provide a fresh set of plants as the older ones died out was so complete that during the last ten years the trees yielding these fruits in the island have become local curiosities.

* * *

At the meeting of the Chemical Society to be held on Thursday evening next, papers will be read "On the Magnetic Rotation of Chemical Bodies in relation to their Composition and Constitution," by Dr. Perkin, F.R.S.; "On the Effect of High Temperatures on Petroleum Hydrocarbons," by Drs. Armstrong and Miller; and "On Nitrification" (Part III), by Mr. R. Warington.

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

A meeting of this society was held in the Council Chamber, Church Institute, May 29. The President, Mr. S. Taylor, in the chair.

After the election of five new members, Mr. E. Yewdall read a paper on "The Advantages and Responsibilities of the Retail Chemist and Druggist under Existing Laws."

Mr. Yewdall reviewed the position of the retail chemist for the past thirty years, and gave a historical account of the work done in obtaining the Pharmacy Act, pointing out the similarity of the principal clauses in each of the Bills originally presented to Parliament, with the object of showing that it was not because a more stringent Act had not been sought for, but in consequence of the free trade principles so predominant in the House of Commons, that an Act better suited to the wants of the body of chemists and druggists had not been obtained. He thought the penal clauses of the Bill sufficiently strong to protect the titles of pharmaceutical chemist or chemist and druggist, and maintained that the protection was quite as much as the College of Surgeons was able to offer and such as the public would eventually recognize more fully than is done at the present time. The dealing in scheduled poisons and similar preparations by unregistered persons was considered as demoralizing to the trader, rendering him liable to a conviction with penalties, which, once obtained, would carry its own condemnation; the practice is, moreover, unfair towards pharmacists and fraught with danger to the public. Chemists and druggists should endeavour to improve their position, not by battling with unprincipled men, but in the manner indicated in the eloquent address given by Professor Attfield to the members of the Pharmaceutical Conference last year. Although inconvenience and annoyance have arisen from the practical working of the Weights and Measures Act, yet the advantages consequent upon accuracy in minim measures must be great, as a drop, more or less, of an essential oil in the preparation of a perfume materially alters the product, and in the preparation of medicines containing hydrocyanic acid or the solutions of the alkaloids, accurate uniformity is of great importance. In the graduation of covered pots for ointments, it was thought they would be better adapted for the purpose if olive oil at 60° F. was used instead of water at the same temperature. The practice of a more frequent examinations of the powders received from wholesale houses to avoid being charged with sophistication under the Sale of Food and Drugs Act, would be advantageous to the chemist and druggist in rendering him more familiar with the processes of detection and thus enable him to bring before the Association subjects for discussion. In referring to the depression which has lately affected pharmacy, the author thought the medical profession did not consider the position of the retail chemist as it ought to do; in too many instances a prescription is written for some proprietary article, respecting the composition of which there was either a doubt or the ingredients are so well known that in the interests of the members of the medical profession it was important that a properly written prescription should be given, by which the chemists could prepare the medicine. If this course was not adopted the patient who had found benefit from the proprietary article had no compunction in recommending it to his friend, and thus the medical man lost his fee and the retail chemist his legitimate profit.

The President, in opening the discussion, stated his concurrence with the views held by Mr. Yewdall, and expressed the hope that the Association was about to enter on a more active phase of its existence.

Mr. R. Reynolds desired to express the obligation of the Association to Mr. Yewdall for his historical review of several matters which had much interest for pharmacists during the past few years. He did not expect that any great comfort would be found by those who had no great reason to complain of the condition of pharmacy in England, but it was worth pointing out that this state of things had arrested the opening of new business establishments. Respecting the action of the Pharmaceutical Society, through its Council, in maintaining the existing law against offenders, he could state that it was by no means so inactive as had been often supposed and sometimes publicly asserted. The Society had taken active measures during the past year with regard to several infringements of the Pharmacy Act in Leeds, and it was still ready to investigate complaints as to illicit trading. Mr. Yewdall, as he knew, had always done the Society justice in recognizing what it did, and was himself equally active, as a member of the Executive Committee of the Trade Association, in endeavouring to make the law respected. He (Mr. Reynolds) regarded Mr. Yewdall's paper as peculiarly opportune and a fitting prelude to that call to practical action which might come at any moment, when the promised Bill for the further Regulation of the Sale of Poisons was introduced by the Government. It was to be feared that a Bill to which they could give an unqualified assent would not be presented; it was, therefore, well to be prepared for prompt action.

Mr. Reynolds moved a vote of thanks to Mr. Yewdall for his paper.

Mr. Jas. Abbott seconded the proposition, and alluded to the necessity for accurate measurement by patients of concentrated medicines; he referred also to the considerable variation in the internal capacity of dispensing bottles.

Several other trade topics mentioned by Mr. Yewdall were discussed by the Secretary, Mr. Shillito, and others.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual meeting was held at the George Hotel on Tuesday evening. Mr. Councillor Fitzhugh, F.C.S., presiding.

The members present expressed their congratulations to the President upon the honour which had recently been conferred upon him in having been elected by the Lord Chancellor as one of the Justices of the Peace for the Borough.

The Secretary presented the Council's Annual Report, which showed that advance and progress had been made in the work of the society during the past year. Suitable rooms had been obtained for the use of the members and associates. Cases to contain the library and specimens of materia medica had been placed in them, and a number of standard works had been purchased and added to the library, thereby much increasing its usefulness. Twenty-five associates have joined the Society during the past session. Meetings have been held monthly; the associates' meetings having been opened with a conference and *soirée*, both of which were a great success. Lectures have been delivered by Mr. F. H. Spencer, on "The Ear," illustrated by models; by Professor Clowes, D.Sc., F.I.C., on "Spectrum Analysis," of a most able and interesting character and admirably illustrated by Mr. A. H. Simpson with the oxyhydrogen lantern; by Mr. H. Major, B.A., of Leicester, on "Epidemics." During the winter a most successful pharmaceutical chemistry class had been conducted by Professor Clowes at the University College. It continued over two college terms, the attendance of the students the first term being 88 per cent., the second term 77 per cent. At the close the Professor conducted an examination extending over two evenings, at which 50 per cent. of the students passed. There has also been a meeting of the young men every Friday evening at the

Institute rooms. In all, sixteen meetings have been held, with a good and encouraging attendance at each. Members of the Council have been present each evening and presided over the meetings. The discussions have been upon subjects bearing upon the work in which the associates have been engaged during the day. Mr. William Widdowson kindly volunteered to conduct a class on materia medica and pharmacy for those young men who were preparing for the London Minor examination. Those who have had the opportunity of attending bear testimony to the value the lectures have been to them, and the thanks of the Council and Association were given to Mr. Widdowson for his kindness in undertaking this work. The library has been well used by the associates, the number of issues having been larger than in any previous year. The Association has lost by death during the year Mr. J. H. Atherton, F.C.S., a former President, Mr. S. Littlewood, Sutton-in-Ashfield, and Mr. Thomas Harrison, late of Wheeler Gate, all of whom had been members of the Society since its commencement.

A vote of thanks was passed to the Officers and Council of the past year on the motion of Mr. Roberts Jackson, seconded by Mr. Inger.

The ballot for the Officers for 1884 and 1885 was next taken, and resulted as follows:—President, Mr. Councillor Fitzhugh, F.C.S.; Vice-President, Mr. M. H. Humphries; Treasurer, Mr. W. H. Parker; Honorary Secretary, Mr. C. A. Bolton; Council—Messrs. A. E. Beilby, T. B. Fletcher, S. V. Holgate, A. Smith, C. W. Warriner, F. White, J. Wilford and W. Widdowson.

Messrs. R. H. Beverley and J. Lewis were appointed the Auditors.

The Treasurer presented his Annual Financial Statement, which showed the finances to be in a most satisfactory and healthy condition. The expenditure had been £53 13*s.* 5*d.* Income £73 5*s.* 10*d.* The balance, including amount on deposit in the bank, reaches £73 3*s.* 8*d.*

The prizes kindly offered by Mr. J. H. Haywood, of £1 1*s.*, and Mr. A. Middleton, of 10*s.* 6*d.*, at the commencement of the session, not having been able to be competed for by the associates at an examination, were allowed to stand over until next session.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Sunday, May 25, the members of the above Association, with a few friends, took a botanical ramble in the neighbourhood of Marple, Cheshire. The facilities afforded by the district of Oldham for the practical study of botany are exceedingly few, as for miles around are nothing bnt cotton mills and iron-works, etc.; this being the case, those who wish to study botany from fresh specimens are obliged to travel many miles to meet with anything like a fair amount of vegetation. This was the object of their journey, and a large store of spring flowers for study was gathered.

On Tuesday evening, at the usual weekly meeting of the Association, held in their room, Chnrch Institute, the numerous plants gathered on Sunday were classified, each plant being placed in its natural order, its peculiarities of structure, mode and place of growth being noticed.

MANCHESTER PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held in the Materia Medica Museum, Owens College, on Thursday evening, May 22. Mr. A. H. Jackson, B.Sc., President, in the chair.

The minutes of the previous meeting having been read and confirmed, the Chairman called upon Mr. A. D. Breeze, to read a paper on "The Poisons Question—Is Legislation Necessary?"

The author, having quoted Sections II. and XVII. of the Pharmacy Act, 1868, gave a very interesting summary of the existing grievances relating to the retailing of poisons and sale of patent medicines of a poisonous nature, suggesting that the infliction of a heavier penalty than that now prescribed by the Act would prove beneficial in discouraging the illegal sale of poisonous drugs.

The paper was followed by a lengthy discussion in which the Chairman, Messrs. Elborne, Thornley, Mitchell, Rhodes, Thomas and Kirkby, took part; and the following resolution, proposed by the Secretary, was carried by the majority of members present:—"That all poisons sold as 'vermin killers' should be classed in Part I. of the Poison Schedule, unless labelled as not containing any of the poisons mentioned therein.

The Chairman then called upon the Secretary to read a letter which had been received from the manager of Messrs. Tennants and Co., inviting the members of the Association to inspect their large chemical and sulphuric acid works, at Ardwick Green. It was resolved that the kind invitation be accepted.

The Secretary then read a letter from Mr. James Hart, of Embden Street, Manchester, expressing his pleasure that a Pharmacy Students' Association had been formed in Manchester. This, he thought, was a move in the right direction, and augured better for the "future of pharmacy" than anything that had yet taken place there. As one who took great interest in the future welfare of the trade, he was prepared to offer as an incentive an annual prize of one guinea for competition amongst the members of the Association, for the best collection of plants found within a given radius of Manchester, or to be devoted to the furtherance of pharmaceutical research in any way which the Committee might consider expedient.

It was unanimously resolved to accept Mr. Hart's kind offer, the best mode of awarding the prize being referred to the Committee for consideration.

The next meeting will be held on Thursday evening, June 19, at 8 p.m., when a paper will be read by Mr. J. Brooks Thornley on "Sulphuric Acid Manufacture."

On Saturday afternoon, May 24, at the Botanical Gardens, Old Trafford, Mr. William Elborne (Assistant-Lecturer on Materia Medica, Owens College) delivered an interesting lecture on "Botany," to a social gathering of members of the above Association. The lecturer gave a general sketch of the characters of the various classes and divisions of the vegetable kingdom, and described in a very lucid manner the organs of nutrition and reproduction, their individual functions and structure. There was a good attendance, the consensus of opinion being that a most enjoyable afternoon had been spent.

HAWICK PHARMACEUTICAL ASSOCIATION.

The annual meeting of this Association was held on Tuesday, June 3. There was a good attendance, and Mr. Maben (Hon. President) occupied the chair.

After a few introductory remarks by the Chairman, the reports of the Secretary, Treasurer and Librarian were submitted. From these it appeared that the Society was in a good condition in every respect.

The following office-bearers were elected for the ensuing year:—Hon. President, Mr. John Craig; President, Mr. Lawson; Secretary, Mr. J. A. Hislop; Treasurer, Mr. T. Maben; Librarian, Mr. W. B. Rawlinson.

It was moved and carried by a majority that the name of the Association be altered to "The Hawick Pharmaceutical and Chemical Association," and the constitution was amended so that all past and present science students would be eligible for membership.

It was resolved to apply to the Committee of the

British Pharmaceutical Conference for a copy of the 'Year-Book of Pharmacy.'

It was agreed to issue a syllabus for next session, for which a number of papers had already been promised, and also to have botanical excursions instead of in-door meetings during the summer months.

After the business had been disposed of, Mr. Dechan, chemist, showed and explained a large collection of apparatus as used in analysis. Amongst these was a novel arrangement for filtering at the boiling point, the idea of which was taken from an apparatus for a similar purpose figured in a recent number of the *Journal de Pharmacie et de Chimie.*

A herbarium of the flora of the district was on view, and the Hon. President described the method of collecting, drying and mounting specimens.

It may be stated that the Secretary's report referred to the fact that the Association had commenced to form a herbarium of the local flora; this has already made considerable progress, a number of plants connected therewith being on the table.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 5. Dr. W. H. Perkin, F.R.S., President, in the chair.

It was announced that a ballot for the election of Fellows would take place at the next meeting of the Society, June 19.

The following certificates were read for the first time:—F. Broughton, F. J. Down, F. G. Holmes, J. Hulme, C. Thompson, W. F. Wyley.

Mr. C. E. Groves then read a paper—

On β-Naphthaquinone.—In a preliminary notice read before the Society some time back (*Chem. News.*, xliii., 267) the author mentioned that he had carefully repeated some experiments of Liebermann, but could not agree with him as to the value of β-naphthol orange as a source of β-naphthaquinone. In the present paper, full details are given of the preparation of amido-β-naphthol hydrochloride from the β-orange, by reduction with stannous chloride and with alkaline sulphides. Although this reaction is interesting theoretically it is far inferior in simplicity and economy to the process originally proposed by Stenhouse and the author (*Jour. Chem. Soc.*, 1877, ii., 47, and 1878, *Trans.*, 415), which consisted in preparing nitroso-β-naphthol from β-naphthol by the action of nitrosyl sulphate and then reducing the barium derivative by ammonium sulphide. As sodium nitrite is prepared now on the large scale almost pure, the author has substituted for the nitrosyl sulphate, a mixture of sodium nitrite and dilute sulphuric acid; the sodium nitroso-β-naphthol is then introduced in the moist state into a solution of stannous chloride and hydrochloric acid and thus converted into amido-β-naphthol, a large excess of stannous chloride being avoided. The author prefers the use of ferric chloride to convert the amido derivative into the quinone. This process is much simpler and cheaper than the method proposed by Liebermann. Nitro-β-naphthaquinol $C_{10}H_5NO_2(HO)_2$—In a former paper it was mentioned that this body, together with the amido-β-naphthaquinol, was obtained by the action of hydriodic acid and phosphorus on the nitroquinone. These bodies can be more conveniently prepared by the employment of stannous chloride as the reducing agent. In conclusion the author draws attention to the fact, that, although he had, in a paper published in conjunction with the late Dr. Stenhouse, mentioned the production of amido-β-naphthaquinone by the action of reducing agents and more recently had stated in the *Berichte* that he was engaged in an investigation of nitro-β-naphthaquinone and the products obtained from it by the action of reducing agents, yet a student of Professor Liebermann's has recently published a note in which he describes the reduction of nitro-β-naphthaquinone to amido-β-naphthaquinone without the slightest reference to its having been already done.

The two following papers were then read by the Secretary:—

On a Bye-Product of the Manufacture of Aurin (Part II). By A. Staub and Watson Smith.—In a previous paper it was shown that the product in question, phenylorthooxalic ether, was formed by the direct union of two molecules of phenol with one of anhydrous oxalic acid. The authors have prepared a perfectly pure specimen by repeated recrystallization from glacial acetic acid, and an analysis agrees with the formula $C_{14}H_{14}O_6$. Analogous compounds with α and β naphthols have been obtained, but no corresponding body could be obtained with resorcinol. The melting point of the phenylorthooxalate was found to be 126°–127°. When heated with strong sulphuric acid, aurin is obtained. If phenol be present the yield of aurin is not increased. Only traces of formic acid are evolved during the reaction. The authors conclude that the orthophenyloxalate plays no part as an intermediate product in the formation of aurin. They also prove that not a trace of aurin is formed by the action of nascent carbon dioxide on phenol.

On Calcium Hydrosulphides. By E. Divers and Tetsukichi Shimidzu, of Tokio.—One part of lime prepared by igniting precipitated calcium carbonate is made into a thick paste by mixing with four parts of water, hydrogen sulphide is passed through, the lime gradually dissolves, more lime is added, until a solution of the hydrosulphide strong enough to crystallize when cooled is obtained. The preparation of such a solution may take several days. Air must be completely excluded and the process is facilitated by cooling. The solution having been prepared is allowed to settle at a slightly warm temperature, so that any crystals which have formed may be dissolved, and then decanted in an atmosphere of hydrogen sulphide. On cooling, colourless prismatic crystals of $Ca(HS)_2$, $6H_2O$ separate out. They are very soluble in water and alcohol; decompose when heated and when exposed to the air. Analyses are given proving the above composition. When this substance is treated with water and calcium hydrate, calcium hydroxyhydrosulphide is formed, $CaHSHO,3H_2O$. This body crystallizes in colourless four-sided prisms, slowly evolving hydrogen sulphide when exposed to the air. By gently heating the hydrosulphide in a current of hydrogen sulphide, calcium monosulphide mixed with some hydroxide was obtained as a white amorphous solid. Carbon dioxide decomposes the calcium hydrosulphides, and the authors find that hydrogen sulphide decomposes calcium carbonate, so that carbon dioxide mixed with an excess of hydrogen sulphide may be passed through lime water without causing a turbidity. Odling states that when calcium hydrosulphide is boiled with sulphur, hydrogen sulphide is liberated; calcium pentasulphide is formed under these circumstances. The authors show that hydrogen sulphide bubbled through a cold dilute solution of pentasulphide effects the reverse reaction, and reforms the hydrosulphide. In conclusion, the authors have investigated the formation of thiosulphate from the hydrosulphide and the pentasulphide, and they conclude that in both cases it is not a direct oxidation, but that the hydrogen sulphide oxidizes, and then by the reaction of its products forms the thiosulphate. They give the following equations:—

$$CaHSHO + 2O_2 + HS_2 = CaS_2O_3 + 2H_2O$$
$$CaS_5 + 2H_2O = CaHSHO + 3S + H_2S.$$

The hydrosulphide then reacts with oxygen and the hydrogen sulphide as above.

The Society then adjourned to June 19, when a ballot for the election of Fellows will be held, and the following papers read:—"On the Magnetic Rotation of Chemical

Bodies in relation to their Composition and Constitution." By W. H. Perkin, F.R.S.; "On the Effect of High Temperature on Petroleum Hydrocarbons." By Drs. Armstrong and Miller; "On Nitrification," Part III. By R. Warington.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, May 29, Mr. H. G. Greenish, Vice-President, in the chair.

The first paper read consisted of some notes on—

Asafœtida.

BY R. W. C. PIERCE.

The name asafœtida is derived from the Arabic "asa," healing, or "isa," remedy, and the Latin "fœtidus," fetid. The botanical source of asafœtida is now generally attributed to two large umbelliferous plants, *Ferula narthex*, the *Narthex asafœtida* of Falconer, and *Ferula scorodosma*, or the *Scorodosma fœtidum* of Bunge. *Ferula narthex* was discovered by Dr. Falconer in 1838 on the northern slopes of the mountains dividing Kashmir from Western Thibet, seeds of which he sent to the Edinburgh Botanic Gardens, where they germinated and produced a plant which flourished for several years, but died after flowering. Plants more or less allied, and also said to afford asafœtida, have been met with in Herat and Afghanistan. *Ferula scorodosma* was collected in 1841 by Lehmann on the east side of the sea of Aral, and also in Bucharia. It probably extends over a wide district of Turkestan, Northern Afghanistan and Eastern Persia. Whether this plant is the *Ferula asafœtida* of Linnæus cannot be certainly decided. There is no doubt that the drug is afforded by other allied species of *Ferula* besides the two previously mentioned. The *Ferula asafœtida* of Bunge, now called *Ferula alliacea*, yields asafœtida, which is known in the Bombay market as "Hing" at the present day. Asafœtida is, according to Flückiger and Hanbury, the produce entirely of Afghanistan, but, according to Dr. Dymock, it is also produced in the province of Laristan, in Persia. The drug is forwarded to Bombay principally by way of the Persian Gulf. The asafœtida which comes from Southern Persia is supposed to be derived from *Ferula scorodosma*, and that from Afghanistan is supposed to come from *Ferula narthex*. This latter plant, however, has never been found by anyone except Falconer for certain, and by him only in Thibet, hence the botanical source of the Afghanistan asafœtida is merely conjectural. The consumption of asafœtida in Europe, America and other places is small in comparison with the amount used in Persia and India, where it is known as "Hingra." Asafœtida was known to the Arabians and Persians of the middle ages, who mention two kinds, one good, or sweet, the other fetid. In the 13th century the Meddygon Myddfai, or physicians of Myddfai, considered it as one of the substances which every physician ought to know and use. It constitutes a favourite seasoning for food with the inhabitants of many parts of the East. The Indian Banians, who never eat animal food, use it in almost all their dishes and before their meals; even rub their mouths with it in order to stimulate their appetite. It is sometimes used by our own cooks, but in very minute quantity, in place of garlic. In many parts of Arabia and Persia it is much esteemed as a remedy for various internal diseases and as an external application to wounds. With us it is considered a powerful medicine in several disorders. It has been applied with suceess in the cure of whooping cough and worms, and in flatulent colics. The part of the plant from which the drug is obtained is the root, in which, after it is four years old, incisions are made. The upper part of the root, which is sometimes as thick as a man's leg, rises somewhat above the surface of the ground. When cut, the asafœtida exudes in the form of a white thick juice like cream, which, from exposure to the air, becomes at last of a dark brown colour. It is very apt to run to putrefaction, and hence those who collect it carefully defend it from the sun. The fresh juice has an excessively strong smell; a single drachm of it is said to smell more than a hundred pounds of the dry asafœtida brought to us. The harvest commences when the leaves begin to decay, and the whole gathering is performed by the inhabitants of the place by four different journeys to the mountains. The quantity yielded by a root varies from half an ounce to two pounds. The product got from the first cutting, which is thinner, more milky and less esteemed than that obtained afterwards, is not sold in its natural state, but is mixed with soft earth, which is added to the extent of an equal, or even double, weight of the gum resin, according to the softness of the latter. It is stated that a single ship is exclusively devoted to transporting the bulk of the drug to ports in the Persian gulf, and that when smaller parcels are carried it is usual to tie them to the top of the mast.

As found in the shops asafœtida is in irregular masses, softish when not long exposed, of a yellowish or reddish-brown colour, externally, exhibiting when broken an irregular whitish, somewhat shining surface, which soon becomes red on exposure and ultimately passes into a dull yellowish brown. This change of colour is characteristic of asafœtida, and is ascribed to the influence o air and light upon its resinous ingredient. The massef appear as if composed of distinct portions agglutinated together, sometimes of white, almost pearly tears embedded in a darker, softer and more fetid paste. It is rarely met with in separate tears, which are roundish flattened, oval or of irregular shape, from the size of a pea to that of a large almond or larger, yellowish or brownish externally and white within, and not unlike ammoniac tears, for which they might be mistaken except for their odour, which, however, is weaker than that of the masses, to which latter they are considered inferior. A very fine variety of asafœtida is said to be obtained from the leaf-bud in the centre of the root. It is known in the Indian bazaars as kandahari hing, but it is not found in European commerce. It occurs in moist flaky pieces and tears, yielding a reddish-yellow oil on pressure and mostly mixed with the remains of leaf-buds. Asafœtida has a powerful but not purely alliaceous odour and a bitter acrid and durable taste. It becomes harder and more brittle by keeping and also diminishes in smell and taste It softens by heat without melting, and is difficult to powder. According to Berzelius its specific gravity is 1·327. I have taken the specific gravity of two specimens, one being 1·2 and the other, which we shall see further on contains a very large amount of adulteration, being 1·7. It is inflammable, burning with a clear lively flame. It yields all its virtues to alcohol and forms a clear tincture which becomes milky on the addition of water. It forms a whitish or pinkish-white emulsion with water. When rubbed up with sulphuric acid in a mortar, then diluted and the solution neutralized by ammonia, the then slightly coloured solution exhibits a bluish fluorescence, which is due to the presence of umbelliferone. Touched with nitric acid, specific gravity 1·2, the tear becomes of an evanescent green colour. The asafœtida of commerce has been shown to be always more or less impure. The common impurities are stones, sand, powdered gypsum and wheat or barley flour, mixed in varying proportions according to the consistence of the gum resin. At Bombay it is further adulterated, frequently by opening the packages and mixing it with gum arabic.

Asafœtida consists of resin, gum and essential oil in varying proportions. The proportion of oil varies from 3 to 9 per cent, the gum from 26 to 32 per cent., and the resin from 47·2 to 65 per cent. The resin is almost entirely soluble in alcohol, ether, and chloroform, it dissolves without decomposition in warm concentrated

nitric acid. It contains a little ferulaic acid. Fused with caustic potash it yields resorcin, and by distillation oils of a green, violet or red tint, besides about ¼ per cent. of umbelliferone, $C_6H_9O_3$. The mucilaginous matter of asafœtida consists of a gum soluble in water and an insoluble portion which is bassorin. The volatile oil has a light yellow colour, with a very repulsive odour. It is at first neutral, but on exposure becomes acid and acquires a different odour. It contains from 20 to 25 per cent. of sulphur, and on being distilled evolves sulphuretted hydrogen.

"Hing," the medicinal asafœtida of the natives of India, obtained from *Ferula alliacea*, consists of 37·50 resin and essential oil, 23·75 of gum. It may be distinguished from commercial asafœtida by not yielding a fluorescent solution, by its tincture not being precipitated by acetate of lead and by containing slices of roots, stem remains only being found in ordinary asafœtida, whilst the alcoholic tincture of the latter is precipitated by acetate of lead.

In the British Pharmacopœia the test for asafœtida is that it dissolves almost entirely in rectified spirit. As there is from 26 to 32 per cent. of gum this cannot be true, without taking into account impurities which are always present. According to the United States Pharmacopœia it is partly soluble in ether, and at least 60 per cent. of it should dissolve in alcohol of specific gravity ·820, containing 91 per cent. by weight of C_2H_5HO. The German Pharmacopœia gives the following characters:— "It gives a yellow colour with caustic soda. Does not strongly effervesce with hydrochloric acid, and is not coloured by contact with the acid for six hours. It should not leave more than 10 per cent. of ash." I have worked a little upon these tests with the following results:—

No. 1. Tear asafœtida yielded 5 per cent. of ash and yielded 56 per cent. to s. v. r.

No. 2. Lump asafœtida yielded 56 per cent. of ash and yielded 26 per cent. to s. v. r.

No. 3. Lump asafœtida, specific gravity 1·77, yielded 56 per cent. ash and yielded 26 per cent. to s. v. r.

No. 4. "Strained" asafœtida yielded 25 per cent. ash and yielded 50 per cent. to s. v. r.

No. 5. Lump asafœtida, specific gravity 1·2, yielded 12 per cent. ash and yielded 54 per cent. to s. v. r.

They all gave the NaHO reaction and the fluorescence, but they were all coloured of a greenish blue by HCl almost immediately. Nos. 3 and 4 are very impure, heavy, and have a sandy appearance.

The samples were obtained from different wholesale and retail houses, and from the Society's Museum.

Some years ago Professor Maisch, of Philadelphia, published the result of his analyses of several samples of asafœtida taken by the drug inspector of the port from different cases and from different parts of the mass. It was as follows:—

	1.	2.	3.	4.	5.
Total resin and volatile oil . .	36·48	43·89	62·93	39·48	30·08
Impurities . . .	57·50	44·01	15·20	51·70	62·09
Gum, moisture and loss	6·02	12·10	21·87	8·82	7·83
	100	100	100	100	100

These were samples of amygdaloid asafœtida which a year previously were rejected by the purchaser as adulterated, he claiming that good asafœtida should be entirely free from sulphate of lime. The impurities in the above instance consisted of gypsum and vegetable fragments, as always met with in the resinous matter agglutinating the tears.

Dr. Dymock, in his 'Materia Medica,' states that asafœtida of an ordinary commercial quality in tears yields at least 7 per cent. residue to petroleum ether, lump at least 5 per cent., and that the volatile constituents should not be less than 5 per cent. in tear or 3 per cent. in lump asafœtida.

In the French Codex a "purified asafœtida" is included, and which is directed to be prepared as follows:—

Dissolve the gum resin with heat in a sufficient quantity of 60 per cent. (by volume) alcohol, strain and press, drive away the alcohol by evaporation over a water-bath until the product is sufficiently thick, that when a few drops are thrown into cold water they have enough consistence to work up between the fingers without adhering to them.

A discussion ensued, in which the Chairman, Messrs. Cullinan, Dymond, Lowe and Short took part.

The Reporter on Inorganic Chemistry, Mr. A. J. G. Lowe, then made a report on the "Purification of Crude Antimony Sulphide." This paper will be published in a future number of this Journal.

In the discussion that followed, the Chairman, Assistant-Secretary, Messrs. Cullinan, Dymond and Ince took part.

The Assistant-Secretary announced that at a meeting of the Executive Committee a grant from the Research Fund had been made to Mr. R. A. Cripps for the examination of commercial concentrated infusions and decoctions.

The meeting then adjourned.

INTERNATIONAL HEALTH EXHIBITION.

Conferences on Sanitary Subjects.

The third of the series of Conferences held under the auspices of the Mansion House Council on the "Dwellings of the Poor" was held on Friday, June 6, in the Conference Hall of the Exhibition. Cardinal Manning in the chair.

The first paper read was by Mr. Shirley F. Murphy, M.R.C.S., entitled "Some Difficulties of Sanitary Administration in the Metropolis." He stated that health was everywhere deemed of less importance than mere pocket interests, and, even if people held no higher view of health and life than their pecuniary value, they would be acting wisely in making some sacrifices for their preservation. The only thought which had controlled the arrangement of houses upon a site was for the convenience of traffic and not for the health requirements of the inhabitants. It was not until the year 1855 that London insisted upon the preservation of open spaces at the back or side of the houses which were covering the land, and not until 1862 that the height of a building was held to have any relation to the need for ventilation, and even then only to buildings about be erected in new streets of less than 50 feet in width. To existing streets this provision did not apply, and high, back to back, unventilated houses were permitted on all sides. In 1882 some advance was made, the amount of space in the rear of houses was to have some relation to their size, and for new houses built upon land not previously occupied in whole or in part, before the passing of the Act, an open space equivalent to a strip of little more than 10 feet, continued in proportion to the width of the house, was deemed necessary, and frequently requiring this open space to extend across the whole width of the house. It was true, London possessed sanitary authorities, but it was only after houses were erected and the inhabitants had suffered ill health or lost their lives, that the authorities had power to act. At the present time, the sanitary authorities existed rather for the removal of nuisances than for the prevention of disease. The reason that there had been so little thought for health in the government of the Metropolis was to be found in the difficulties attendant upon the government of London. For years there had been a tendency to place upon central boards duties which should be entrusted only to a body appointed as guardians of the public health. After referring to the difficulties with which sanitary administra-

tion was surrounded, he concluded by saying, that at present, no sanitary administration deserving of the name could be said to exist; the local sanitary authorities had no jurisdiction over many subjects of vital importance to the public health, and the authorities upon whom these duties devolved were not primarily concerned in the prevention of disease.

The next paper, by Dr. B. A. Whitelegge, was upon the same subject. After speaking of the evil effects of overcrowding and bad drainage, he said, in the laws bearing upon metropolitan sanitation, there were many important omissions, but still it was none the less incumbent upon the sanitary authorities to faithfully exercise the powers entrusted to them alone, and to their default in so doing many of the present evils were attributable. Repeated and careful inspection of tenement houses was necessary, and the absurdity of alloting to one man a district with a population of 50,000 or 60,000 was obvious. With the sanitary authority rested the responsibility of taking the initiative in active measures, but in many cases it was reluctant to do so, as all sanitary action meant expense, and short-sighted economy too often interfered with due care for the public health. Much might be done by individual and collective action in organizing public opinion. The poor should be educated as to the vital importance of healthy homes and surroundings, and the means by which unhealthy conditions might be avoided or remedied. The attention of the authorities should be called to all unhealthy conditions which could be found, and care be taken that the evils so reported were remedied. A great deal had been done in this direction by the thirty local sanitary aid committees, formed in connection with the Mansion House Council on the Dwellings of the Poor, over five hundred cases having been inquired into, and in all cases brought before the Committee the utmost secresy was observed as to the quarter from which they received information.

The third paper, by Mr. C. M. Sawell, was entitled "Suggestions to the Royal Commissioners on the Dwellings of the Poor," and proved a somewhat lengthy document. The first suggestion was that no immediate transformation in the condition of the poor could be expected, and that their character needed improvement above all things. Next, it was suggested that the housing of the poor had become a practical monopoly, and various instances were given of the exorbitant rents charged for the vilest accommodation. Thirdly, the system of leases was remarked upon as having a tendency to accentuate the evils complained of, and a suggestion was made that some draconic powers should be given to municipalities to acquire property without paying excessive compensation. Next came some remarks on the land question generally, and the remaining suggestions dealt with the licensing question, the registration of inspection of all houses let out in lodgings, the disqualifying owners of unsanitary property for local offices, the extension of the hours during which common lodging houses may be inspected, Government loans to aid in reconstruction, a reduction of rates on "improved dwellings," and the enforcement of cheap railway accommodation.

Dr. Alfred Carpenter said the practical side of the question bristled with difficulties, one being the antagonism which existed between local self-government and centralization. This difficulty had been enhanced to a great degree by legislation, and therefore they must go to Parliament to get it removed. Another difficulty was that the exigencies of political life prevented arrangements which were made from being carried out. A Commission appointed to inquire into infectious hospitals in connection with London, of which he was a member, recommended the necessity of the separation of sanitary work from that connected with the destitution of the Metropolis, but this proposition had not yet been carried out. He thought it was only by meetings, such as the present, that pressure could be brought to bear upon those on whom hope depended.

The Rev. G. M. Murphy suggested that as speedily as possible the Mansion House Council should call a conference of *bonâ fide* working men; also that there should be a unification of the sanitary laws, and simplicity and promptitude in action.

The Rev. S. Buss suggested that the Artizans Dwellings Act, the Nuisance Removal Act, and various other Acts should be consolidated and amended, and that the building of houses should be entrusted to a department of the State.

The Rev. G. W. McCree thought that if sanitary inspectors were made independent of the body by whom they were appointed, they would do their duty better, not having the fear of dismissal before them in the event of taking action in certain cases.

The Chairman said he thought the proposal that labouring men should become their own landlords was a very good one, and he would always do, as he had hitherto, his best to encourage it. At present the great block buildings housed artizans and even clerks in the city, failing altogether to reach the very poor for whom they were intended. On the Statute Books would be found Acts to meet every case, all that was wanted was a dynamic power to set them in motion, and this power would be obtained from societies like the Mansion House Committee.

On Monday the first of a series of Conferences, under the combined management of the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, was held, under the presidency of Dr. Orme Dudfield, President of the Society of Medical Officers of Health and Medical Officer of Health for Kensington.

The first paper was by Dr. Tripe, Medical Officer for South Hackney, on "The Domestic Sanitary Arrangements of the Metropolitan Poor." The word "poor" was used in its largest sense, as including all who live in very small houses or tenements. The writer said the sanitary arrangements of many of those houses were disgustingly defective, and owing to the dirty habits of many of the inhabitants, even fairly good water closets were so misused as to convert them into the most filthy places it was possible to conceive. Persons of this class could scarcely be said to have any sanitary arrangements whatever. Another class of houses, those containing five or six rooms, in which two or more families lived, were somewhat better, and in such houses the enforcement of the regulations made under sec. 35 of the Sanitary Act was of great service. The difficulty was, however, that if inspection were very frequent, and the owners put to much expense, the rents were increased, and the tenants as a consequence, ejected, to carry a bad example elsewhere. On the other hand, if due regard were not paid to sanitary arrangements, disease might arise and spread. The opinion was expressed that the Peabody and similar buildings were not so suitable for the very poor as smaller houses with outbuildings. The most important of sanitary arrangements was the water supply, and a constant supply was much preferable to an intermittent one; there should always be a cistern which would supply the closet, but the water for potable purposes might be drawn from the main before it reached the cistern. Where the constant system was not in operation there should always be a flushing box between the cistern and the closet, and great care must be exercised to see that this flushing box was properly arranged and fixed, or it would be rendered useless. The different kinds of taps, etc., in use under the constant system were then discussed, many complaints being made of the time required in some cases to draw a pail of water. A direct connection between the sink and the sewer was a fruitful source of mischief from the influx of sewer gas. The heads of rain-water pipes often opened near windows, and when connected directly with the sewer acted in the same way as conductors of foul gases. The drainage of

old houses was often very defective, being constructed of bricks with open joints; all such drains should be relaid in pipes laid in concrete. Dustbins were usually a source of discomfort and often of disease; when made of wood they were frequently destroyed, and strong sheet iron was much preferable. The practice of asking for gratuities when the dust was removed was a great check on the frequent emptying of the dustbins, and where the removal was contracted for at a lump sum it was the interest of the contractor to remove it as rarely as possible.

The next paper, by Mr. Ernest Turner, F.R.I.B.A., was on "The Improvement of the Sanitary Arrangements of Metropolitan Houses." He thought the real problem was the sanitary housing, not of the artizan, but of the labourer, and, in order to solve it, they must face its conditions as they arose, and not invent them. The most inexorable of these conditions was just the one which many had hitherto devoutly refused to accept. The labourer had to live in one room, and it was no good endeavouring to persuade him that he could occupy more, as he could not afford more than 3*s.* 6*d.* to 4*s.* a week, and for this sum only one room could be obtained. The introduction of common kitchens and dormitories either undivided or divided into cubicles was a question well worthy of the consideration of the new Royal Commission. Common lodging-houses were by far the most sanitary of any dwellings of the poor, owing to systematic inspection, and if model lodging-houses were constructed to look a shade less like model prisons they would be regarded with more favour by the poor. Upon the question of sanitary fittings he strongly endorsed Dr. Tripe's views as to the supreme advantage of absolute simplicity. He drew attention to plans of a block of buildings recently erected in Westminster, which were admirably constructed in every way,—the soil pipes outside the buildings, and properly ventilated,—and yet paying more than 7 per cent. A very important improvement in the construction of these rooms was the character of the partitions formed of corrugated sheet iron covered with plaster, a specimen of which was exhibited. These partitions are only two inches thick, thus saving space, and they were believed to be fireproof, owing to the addition of sulphur to the cement, and would be readily disinfected. The most common defects, from a sanitary point of view, were next referred to briefly, all of which might be seen illustrated in the model of the unsanitary house in the Exhibition, whilst the sanitary house by the side would show what the corresponding arrangements should be. Old houses, though usually defective, would often stand pulling about a little better than new ones, and one thing, the most necessary, could always be done, viz., disconnecting the drains by interposing a water-trap and communication with the fresh air between the sewer and the house; waste pipes should also be made to discharge in the open air, and the water cistern rendered easily accessible, properly covered, and cut off from all communication with the drains.

Mr. Rogers Field emphasized the importance of means of attending to the water supply of the cistern being readily accessible, and of effective flushing apparatus for closets. He did not expect to find any house free from sanitary defects if built more than ten years, and many of those now being built were equally defective. London not being under the Public Health Act, 1875, the immense number of houses constantly being built in the metropolitan district were not properly under control; though in many cases proper arrangements were cheaper than bad ones, they were too often neglected. The only two instances in which he had been interfered with by the sanitary authorities were to prevent his constructing ventilating man-holes.

Professor Corfield drew attention to the importance of dustbins being frequently cleansed and all refuse removed. Some years ago contractors had large sums for the dust and were therefore anxious to get it; now the system was reversed and therefore the only way to insure its regular removal was for the sanitary authorities to undertake the work themselves. The most common defect in London houses was the connection of the water cistern with the drain or sewer.

Dr. Alfred Carpenter agreed with Dr. Corfield as to the removal of dust, and said it was also important that the quantity of dust should be kept as small as possible by improved fire places and the use of gas for cooking and heating. He also recommended frequent visits to the Parkes Museum, Margaret Street, where the best appliances of all kinds, both with regard to drainage and water supply, might be seen.

Dr. Bartlett, in the course of his remarks, alluding to the danger from fire in large blocks of buildings, unless they were thoroughly fire-proof, said from some experiments he had made with cement with which sulphur had been incorporated he believed it would be very valuable in enabling it to stand both fire and water.

Dr. Bernays, spoke of the good quality of London water as supplied by the companies before it got contaminated in the cisterns and said that much of the dustbin nuisance would be removed if vegetables were more carefully prepared before they were supplied to the consumer.

Mr. John Slater referred to the importance of a damp course and of ventilating under the ground-floor, and also advocated iron pipes for drains under houses.

The second of this series of Conferences took place on Tuesday, Captain Douglas Galton, R.E., C.B., F.R.S., in the chair.

The first paper read was on "Domestic Sanitation in Rural Districts," by Dr. George Wilson, Medical Officer of Health, Mid-Warwick District. Dr. Wilson's paper dealt with the questions of labourers' dwellings, water supply, and the disposal of refuse. On the first point he quoted an estimate based on the report of the Agricultural Commission of 1867, that one-third of the rural homes of England were unfit for human habitation, and that, therefore, 700,000 hovels ought to be pulled down. In many villages with which he was acquainted 10 to 15 per cent. of the cottages only contained one sleeping room and about half only two; though in that district, viz., Warwickshire, the defects were, according to the report of the Commission, much less glaring than in many other counties. Many of these defects could be dealt with under the Public Health Act, but a do-nothing policy was often encouraged by the appointment of officers of health at merely nominal salaries. Where they were precluded from engaging in private practice the improvement had been very marked, and the evil was diminished by the decline of the rural population. One of the great obstacles to improvement lay in the poverty of the owners, and another in the low wages of the occupiers, which prevented their paying rents which would encourage private enterprise in building cottages. Another impediment to improvement was the fact that unless the sanitary authorities applied for urban powers they had no control over the erection of new cottages, and thus jerry-building of the worst description and total absence of sanitary appliances were liable to occur. Thus even in the case of country mansions the cesspool was often in close proximity to the well, the drains leaky and unventilated, and the drinking water cistern connected with the water-closet. There was, therefore, a need for further powers and adequate bye-laws. The defects of water supply were next dealt with, and the provisions of the Public Health (Water) Act shown to be in most respects adequate to meet the case, if only they were put in force. The remainder of the paper was devoted to the three important points of closet accommodation, scavenging, and drainage. The old-fashioned privies and cesspools should be converted into pail or ash-pit closets, the contents of which should be frequently removed and put on the gardens, and this could be done

at very small expense. The great desideratum was to keep the excreta dry and prevent undue accumulation. Where the garden space was insufficient to receive the excreta due provision should be made for removing it at frequent intervals, and this might be accomplished under the Public Health Act. This still left the slops and refuse water to be disposed of, and in villages and places where the population was increasing, covered drains ought to replace the open gutters and the sewage treated by irrigation if there were any danger of its flowing into streams from which the water supply was derived.

The second paper, on "Sanitary Houses for the Working Classes in Urban Districts," by Mr. H. P. Boulnois, was mainly occupied with technical details of construction which should be attended to in workmen's dwellings. Huge block-buildings were considered to be undesirable, though sometimes from the great value of land they were the only means of bringing decent accommodation within the reach of men earning small wages. Basement rooms were condemned, and flat roofs recommended as affording a drying ground or garden, and a means of escape in case of fire. A narrow street at the back was desirable as a means of removing the refuse daily, and all main streets should be at least forty feet wide. The water supply should be constant, and if intermittent the greatest care should be taken in the construction and fitting of the cistern. The principal obstacles in the way of erecting such dwellings were: 1. The avarice of the builder. 2. The ignorance of both builders and tenants. 3. The want of sufficient supervision by the sanitary authorities, mainly owing to a deficiency in the staff.

Sir Henry Acland, Bart., M.D., in opening the discussion, pressed the necessity of relying more upon the general education of the people than upon compulsion for improving sanitary conditions. He also pointed out the necessity of studying economy in the matter.

Sir Robert Rawlinson, C.B., also dwelt principally in his remarks on the necessity of greater economy in carrying out sanitary works, saying he was often shocked at the exaggerated estimates which came before him, and also at the great expense incurred in arbitrations arising out of sanitary improvements.

Dr. Thursfield remarked on the difficulty of carrying out the provisions of the Public Health (Water) Act owing to the limit of expense which could be incurred in providing a water supply, the utmost limit being about £13.

Dr. Woodford (Berkshire) referred to the difficulties which arose from rural sanitary authorities having no power to regulate the erection of building unless they applied for urban powers, and said though these were generally granted on application they very often came too late to prevent the evil.

Dr. Alfred Carpenter spoke at some length on the necessity for further education, which he thought ought to be relied on more than compulsion. The greatest part of the obstacles which medical officers met with in getting their requirements carried out was ignorance on the part of the people.

Sir Thomas Acland, Bart., M.P., also dwelt on the importance of education, and thought it was very desirable that all officers appointed under sanitary authorities or boards of guardians should possess some certificate of competence to fulfil the duties.

Dr. Alfred Carpenter said the Sanitary Institute of Great Britain quarterly held examinations for surveyors and inspectors of nuisances in order to meet this requirement.

The Chairman said no doubt all agreed pretty well as to what might be called a sanitary house, but the mode of construction must differ according to the circumstances of the case. There was no reason why buildings in flats should not be as healthy as smaller houses if they were properly arranged. The great difficulty was finding the money to build these houses. In the country districts he did not see why proper dwellings should not be provided for the labourers who had to cultivate the farms, in the same way as stables were built for the horses, and even in towns it might be desirable for manufacturers to build houses for their workmen, as had been done at Mulhaus and various parts of the Continent, where the workman got a good house built for him and shared in the year's profits. He believed more powers were required, but still those already existing were not utilized to nearly their full extent. In many cases he thought it would be right that public authorities should erect workmen's dwellings, and that they might be made to yield a fair return. He agreed with what had been said on the importance of education, and he believed the Health Exhibition would, in that point of view, have a very lasting effect on the improvement of the sanitary administration of the country.

(*To be continued.*)

ROYAL INSTITUTION.

Electric Induction Experiments.

A lecture of some interest on the above subject was delivered by Mr. Willoughby Smith, before the Royal Institution, on Friday, the 6th inst. The results of some experiments were described by the lecturer as seeming at variance with those of similar experiments by Faraday. Mr. Smith commenced by explaining the methods of producing induced currents, and showed that their comparative strength could be easily measured by means of the reflecting galvanometer. One of the first experiments he made was to show the changes effected by the introduction of a plate of copper or iron between the primary and secondary circuits of an induction coil. If the induced current was formed by one hundred reversals per minute, the insertion of an iron plate caused the induced current to decrease by more than one-half, whilst the insertion of a similar copper plate produced no apparent change. If, however, the reversals were increased to the rate of one thousand per minute, the insertion of the iron plate still reduced the current rather more than one-half, but the insertion of the copper plate caused a decrease to about one-fifth. The lecturer then referred to the experiments made by Arago and Faraday upon a revolving disc of copper in an electric field, and stated that he considered from the results he obtained that the revolving disc might consist of iron or any other metal which is a good conductor. He also remarked that although an equal induced current was obtained from a revolving disc of iron at equal distances before and after the disc entered the electric field, yet with a copper disc the induced current was about two and a half times as strong at a certain point of the disc after leaving the electric field as at an equal distance before entering it. The lecturer considered this difference due to the slowness with which the polarization of copper is effected, and stated that this difference is increased in metals of lower conductivity, with the exception of lead.

Parliamentary and Law Proceedings.

The Extraordinary Case of Strychnia Poisoning.

The adjourned inquest on the body of Thomas Cross, aged 72, a road-sweeper, who was supposed to have died from the effects of the administration of strychnia, was resumed by Dr. Danford Thomas, the Coroner for Central Middlesex, on May 30.

It will be remembered that the deceased suffered from chronic bronchitis, and died suddenly after taking a powder, given him by a married daughter named Isabella Todd, who had recently arrived on a visit from Herne Bay.

The jury considered that the attendance of the drug-

gist from whom the powders were purchased was most desirable.

Mr. W. Neville Wheeler, druggist, of the Hackney Road, said the powders in question were sold by him. They contained nothing but calomel, and it was not possible that a mistake of any kind could have occurred. The poisons were kept apart from the other medicines, and he had not supplied strychnia or nux vomica in any shape or form.

Mr. Augustus Joseph Pepper, Examiner in Forensic Medicine in the University of London, and Surgeon to St. Mary's Hospital, stated that he had received the contents of the stomach for analysis, and had handed them on to Mr. Luff.

Mr. Arthur Pearson Luff, of the Marylebone Road, said that he had made the required analysis, and had detected the presence of strychnia. Neither he nor Mr. Pepper could say how much poison the stomach contained, but it was more than sufficient to kill the deceased.

Mr. Josiah Haynes, who described himself as an auctioneer, said that Mrs. Isabella Todd had formerly lived with him as his housekeeper. She was in the habit of taking calomel powders. He had some strychnia in his possession, which he had purchased to kill a dog, and this he gave to Mrs. Todd by mistake. They had been out together one day; and, at the Victoria Park Station, she not being very well, he took from his pocket what he thought was a calomel powder, telling her to take it at bedtime, as it would do her good.

The Coroner remarked that it was highly dangerous to carry about deadly poisons in one's pocket, and asked how it was that witness had it with him.

Mr. Haynes replied that about four years ago, wishing to kill a dog, he purchased from a friend, a druggist in Somersetshire, some strychnia, some of which he gave to the dog and killed it, whilst the remainder was put away in a box. A few days ago, whilst turning over some papers, he accidentally came across it, and put it in his waistcoat pocket for safety. On reading an account of the case in the papers, he felt in his pocket for the strychnia and found it gone, whilst the calomel powders were still there.

Mrs. Todd, on being recalled, said that Mr. Haynes had at different times given her calomel powders and other medicines, and she remembered his giving her one a fortnight ago, telling her it would do her good.

The Coroner said, if the jury believed the evidence of Haynes, the whole matter was explained as to how Mrs. Todd became possessed of the poison, and there could be no doubt that she divided it into two parts and gave it to her parents.

The Jury returned a verdict to the effect, that death had resulted from strychnia, administered by Isabella Todd in mistake for calomel; and censured the witness Haynes for his "careless and inexcusable conduct" in carrying about poisonous powders.

Death from Chloral.

On Monday, June 9, an inquest was held at Batley, before Mr. Taylor, Coroner, to inquire into the cause of death of Mrs. Mary Hepper. The deceased, who was 67 years old, has for the previous fortnight been at the house of her son-in-law, Mr. C. D. Grundy, dentist, Batley, on a visit. It appeared from the evidence that about eleven years ago the deceased had a fall, which caused a shock to her nervous system, from which she never perfectly recovered. A doctor prescribed for her small doses of chloral to induce sleep, and she had continued the practice of taking this drug ever since, with the exception of a period of two years. It was shown that during her visit to Batley she had taken several doses, although her daughter and son-in-law had tried to prevent her having access to it. She was in bed most of last week, and on Friday night she had a small dose of chloral, after which she continued in a state of slumber until about half-past four o'clock on Saturday afternoon, when she died before a doctor could be got to see her.

The Jury returned a verdict of "Died by misadventure, through taking an overdose of chloral."—*Leeds Mercury.*

Poisoning by a Patent Medicine.

Dr. George Danford Thomas has held an inquest at the University College Hospital, relative to the death of Louisa Hilda, aged twelve months, daughter of a hawker.

Evidence having been given as to the administering of a patent medicine to the infant, the Coroner said there was no doubt whatever that patent medicines were very injurious to children, and should only be given to them under medical advice, for it was well known that they sometimes contained an amount of morphia which would, especially in the case of a child such as the deceased, do more harm than good. The poor saw these patent medicines widely advertised to cure all diseases, but it was to be hoped that before long the law would be altered so that persons would have to make known the contents of each patent medicine before selling it.

The Jury, in returning a verdict in accordance with the medical evidence, expressed their disapproval of patent medicines being given to children without medical advice.—*Standard.*

Obituary.

Notice has been received of the death of the following:—

On the 6th of May, Mr. Richard Lake, Pharmaceutical Chemist, Plymouth. Aged 38 years.

On the 16th of May, Mr. William Adams, Chemist and Druggist, Plymouth. Aged 77 years.

On the 25th of May, Mr. William Pike, Chemist and Druggist, Lower Kennington Lane, London. Aged 58 years.

On the 26th of May, Mr. John Edisbury, Chemist and Druggist, Liverpool. Aged 68 years.

On the 1st of June, Mr. Frederick John Gunn, Chemist and Druggist, late of Axminster. Aged 56 years.

On the 3rd of June, Mr. David Reid, Pharmaceutical Chemist, Aberdeen. Aged 63 years. Mr. Reid had been a Member of the Pharmaceutical Society since 1853.

ANSWERS TO CORRESPONDENTS.

F. Chabot.—Your letter has been handed to the Secretary, who will probably communicate with you on the subject of it.

"*Joules.*"—(1) With pure bromide of sodium and distilled water the phenomenon mentioned has never been observed by us. (2) If the potassium iodide be dissolved in half the water, and the liq. hydrarg. perchlor. be diluted before being mixed, the hydrarg. binioid. formed will be redissolved and the mixture will remain clear.

W. Lyle.—See a paper on "Oleate of Bismuth" in the *Pharmaceutical Journal*, [3], vol. vii., p. 469. There is no recognized formula for an ung. bismuthi oleatis, but a 10 per cent. ointment would be a suitable strength, reducing the oleate either by simple ointment or vaseline.

X. Y. Z.—A pharmaceutical chemist is not exempted as such from filling the office of overseer.

J. H. Beacock.—A reply to your question would involve giving an opinion upon a legal point, for which we have no qualification.

Communications, Letters, etc., have been received from Messrs. Mercier, Wilkes, Fennell, Marshall, White, No. 1.

Medals—1851, 1855, 1862, 1867.

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ALLEN JOHNSON, Major-General,
India Office, 30th May, 1884. Military Secretary.

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ENGAGEMENTS WANTED.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. Disengaged from June 23 to July 19. Terms and references on application.

AS JUNIOR, for the Mixed business. Age 20½. Height 5ft. 8in. Good reference. In-door or otherwise. W. G., 70, Kensington Rd., Southport.

AS Junior ASSISTANT, where one or more are kept. Age 21. Disengaged shortly. W. J. TURNER, 50, Northgate St., Chester.

J. R. DORE, Pharmaceutical Chemist, Huddersfield, can highly recommend a young man as Junior ASSISTANT.

LOCUM TENENS. Qualified. Thoroughly reliable and efficient. Quick and accurate Dispenser and Prescriber. Highest references. Extracts Teeth. Speaks French. COSMOPOLITAN, Mr. Moyle, 27, Broadway, Hammersmith.

IN good class business as ASSISTANT or MANAGER of Branch. First class experience. Disengaged. Age 34. MAJOR, 307, Vauxhall Bridge Rd., S.W.

LOCUM TENENS, or Temporary ASSISTANT. Qualified. By the day, week, or month. Town or country. CHEMICUS, 51, Judd St., St. Pancras, London, W.C.

AS ASSISTANT. Age 26. Height 5ft. 9in. 12 years' experience. Good references. Out-door preferred. W. J., 26, Liverpool St., W.C.

AS ASSISTANT. Age 26. Good testimonials and Dispensing experience. Height 5ft. 11½in. No objection to going abroad. Could Manage. CHEMIST, Mr. M. Mycroft, Higham, near Alfreton.

C. THORNLEY, Chemist, Manchester, wishes to place his son as IMPROVER, in a good class Retail. Age 17. Height 5ft. 5in. 2 years' experience. Passed Preliminary.

AS ASSISTANT or MANAGER in a Chemist's or Surgeon's Retail. First class references, and 6 years' West-End experience. Age 27. Height 5ft. 8in. ARGENTUM, 172, Fleet St., E.C.

AS ASSISTANT. Age 24. Height 5ft. 10in. Over 2 years in last situation. Yorkshire preferred. J. H. BOND, 9, Trafalgar Sq., Scarborough.

TEMPORARY. Ætat. 32. By day or week. Mr. A. WOOD, 7, Woodfield Cres., Harrow Rd., W., is open to engagements as above. Terms moderate.

ADVERTISER, qualified, 27 years of age, wishes for situation as SENIOR or MANAGER. Town and country reference. CHEMIST, 1, West End Terr., Turnham Green, W.

AS SENIOR or ASSISTANT. Major qualification. 8 years' experience. Age 24. E. S. T., 30, Church St., Camberwell.

LOCUM TENENS or Temporary ASSISTANT. References and experience good. Extracts Teeth. Disengaged June 18th. Terms moderate. CHEMICUS, 53, Rye Lane, Peckham, S.E.

AS JUNIOR, in good Dispensing house, with time for study. In or near London. Age 22. First class references. C. E. K., Mr. Lines, Pharmaceutical Chemist, Hertford.

FOR a few months.—Situation as ASSISTANT or MANAGER. Well up in good class Agricultural trade. Good references. CHEMICUS, Mr. Steele, 1, Bognor Rd., Chichester.

ASSISTANT.—Good experience in light country trade. A.1 references. Single handed and outdoor. Abstainer. Aged 34. Height 5ft. 8in. Single. Not qualified. C., 224, Millbrook Rd., Southampton.

ABOUT July 20.—A situation as SENIOR, in a good Mixed business. T., 17, Broadgate, Coventry.

ASSISTANTS WANTED.

OUT-DOOR APPRENTICE in a high class business, where unusual facilities are offered for procuring a thorough knowledge of the business. Premium moderate. Apply T. G. COUSINS & Co., Pharm. Chemists, Oxford.

DENTAL.—A Dentist with a large practice in the North of England has a vacancy for an APPRENTICE. Must be a gentlemanly and well educated youth. Address, Mr. C. W. REEVES, Messrs. Hewlett & Sons, 40, Charlotte St., London, E.C.

APPRENTICE.—Immediately. In a good class light Retail Dispensing business on South Coast. Comfortable home and every opportunity of acquiring a thorough practical knowledge of the business. Premium moderate. Apply either personally to Mr. ROBERTSON, 3, Church St., Camberwell, London, or by letter to E., care of above.

APPRENTICE, in or out-door, in a good class Dispensing and light Retail business. Every opportunity for acquiring a thorough knowledge of the business. Moderate premium. Also ASSISTANT, about 21, for a Mixed business. Apply, stating full particulars to save time, to TAYLOR & DYSON, Pendleton, Manchester.

APPRENTICE.—A vacancy occurs in a good class Family and Dispensing business, for a well educated youth. Pleasant healthy London suburb. Comfortable home and every opportunity given for acquiring a thorough knowledge of the business. Time allowed for study and recreation. Premium required. Apply, 42, Stroud Green Rd., London, N.

LOCUM TENENS ASSISTANT, at a Surgery by end of June, for 2 or 3 weeks. Duties principally Dispensing. Live in. Apply, S., 213, Hill St., Walworth, S.E.

SHORTLY.—Two gentlemanly ASSISTANTS, not under 21, one as Dispenser (Major essential), the other to serve at the Retail counter, and possessing the Minor at least. Apply, stating full particulars to save time, and enclose carte, to E. H. METCALFE, Pharmacist, Malvern.

WARNEFORD HOSPITAL, LEAMINGTON.—Resident DISPENSER.—The Committee of Management of the above Institution require a Resident DISPENSER. Salary £40, with board, apartments and washing. Applications, stating age, qualification and testimonials or references, addressed to The Chairman of the Committee, to be sent not later than THURSDAY, the 19TH of JUNE INSTANT, to the House Surgeon, at the Hospital, from whom further particulars may be obtained. WILLIAM MAYCOCK, Secretary.

June 9th, 1884.

NOTE.—In consequence of an error in the previous advertisement, unacknowledged applications should be repeated.

ASSISTANT, for China.—Must have passed Minor examination. Not under 22. Personal interview preferred. Address, CAMPBELL & Co., 34, Leadenhall St., E.C.

A GOOD and efficient JUNIOR. Satisfactory references indispensable. Apply to C. FLEWITT, 92, High St., Birmingham.

A QUALIFIED DISPENSER for the County Asylum, Whittingham, Lancashire, in consequence of the promotion of the former official to a similar post at the Liverpool Infirmary. Salary £50 a year, with board, lodgings, washing, and attendance. Applications to the MEDICAL SUPERINTENDENT.

AN ASSISTANT of moderate experience required at once. Must be conversant with the Welsh language. Apply to WM. LLOYD, 26, High St., Carnarvon, North Wales.

IMMEDIATELY.—An ASSISTANT, about 24 or 25 years of age, accustomed to Dispensing. Apply personally, to R. A. POTTS, 26, South Audley St., London W. If by letter enclose carte.

ASSISTANTS WANTED.

B. C. POND (Homœopathic Chemist), The Pavement Brixton Rise, S.W., requires beginning of July an in-door ASSISTANT, age about 22, of good experience, thoroughly reliable and a careful Dispenser. One who is qualified and has a knowledge of Homœopathic medicine preferred. Apply personally, or if by letter, with carte and full particulars, also state salary required.

AN ASSISTANT, indoor, not under 22. Would have to take part Management of a suburban business. Must be a good Counterman and accurate Dispenser. State age, height, previous engagements, salary expected, when disengaged, and enclose carte (to be returned). Address, JOSIAH BLACKWELL, Pharmaceutical Chemist, 197, Moseley Rd., Birmingham.

A COMPETENT ASSISTANT, good address and business habits, quick and obliging. Able to take charge in absence of principal. Apply to H. GOODALL, Chemist, Derby, stating age, height, salary and references.

EARLY in July, in-doors, an ASSISTANT from 20 to 25 years of age, accustomed to a Mixed light Retail country trade with Dispensing. Must be steady and general satisfactory references absolutely necessary. No Sunday duty. Please state usual particulars, &c., to J. F. COOK, Chemist, &c., Holbeach.

WHOLESALE.—A competent ASSISTANT accustomed to the Wholesale. State references, salary required and length of time in last situation. Address, SLINGER & SON, Wholesale Druggists, York.

J. THOMPSON, Pharmaceutical Chemist, Lodge Lane, Liverpool, has a vacancy for an IMPROVER, immediately, either in or out-door.

W. T. HICKS & CO., Cardiff, have a vacancy for a competent ASSISTANT (out door) in their Retail. State salary required, references, &c., and enclose carte. A JUNIOR also required.

AN ASSISTANT, about 22, accustomed to Dispensing. Particulars to F. ROSSITER, 20, George St., Hastings.

LEICESTERSHIRE Provident Dispensary.—DISPENSER. Salary £80 per annum, with unfurnished rooms. Application to be made to the MANAGER, Provident Dispensary Leicester.

AN ASSISTANT in a general Retail and Dispensing business. Comfortable home. In-doors. Apply, stating full particulars, to R. E. YOUNGER, 2, Northgate St., Ipswich.

AN experienced JUNIOR, desirous of a short engagement. Would be required until September 30th. Must be competent to take occasional charge in the absence of principal. Apply, stating full particulars as to experience, also age, height, and salary required, to W. DODDS, 10, Hessle Rd., Hull.

IN-DOOR ASSISTANT, qualified, age about 24, competent, steady, gentlemanly appearance and address, polite and obliging. Unexceptional references from last situation. Good Prescriber and accurate Dispenser. Salary £35 to £40. Apply, between 4 and 6 p.m., J. L. MCMILLAN, 21, Formosa St., Maida Hill.

EXPERIENCED and energetic ASSISTANT, for brisk Retail on South Coast. A comfortable permanency for trustworthy man. Out-door, and no Sunday duty. Apply, in first instance by letter only, to U. E., 77, Crofton Rd., Peckham, S.E.

MR. STAMP, Hampstead, N.W., will have a vacancy early in July, for a competent man as DISPENSER. Must be accurate, quick and neat in his work and have had experience in a Pharmacy doing first-class business. A gentleman desiring a permanency will find a comfortable home. Apply personally or by letter, enclosing photo., stating salary required and all particulars.

ASSISTANTS WANTED.

AN ASSISTANT, accustomed to a good general country business. Age about 24. Passed the Minor preferred. Hours, 8 a.m. to 9 p.m. No Sunday work. Apply, stating age, references, and salary required, to GARRETT BROS., Wholesale and Retail Druggists, Newport, Mon.

AN ASSISTANT, for a light Retail and Dispensing business. In-doors. State age, height, experience, reference, and salary required. Photo. (to be returned). Address, HENRY MORNEMENT, Great Yarmouth, Norfolk.

A JUNIOR ASSISTANT. One accustomed to a general country business. Must be steady and obliging. Short hours and no Sunday duty. Apply, with usual particulars and enclose carte if convenient. H. P. TURNER, Chemist, Lydney, Glo'stershire.

FOR the third week in June.—A competent Junior ASSISTANT, well up in Dispensing and can be well recommended. Can attend lectures on Chemistry and Botany in the autumn. Apply, stating all particulars, to GEORGE SHRUBSOLE, City Pharmacy, Town Hall Sq., Chester.

AT once.—As JUNIOR or IMPROVER, in a good class country business. A young man who has served part of his time would be treated with. In-doors. Comfortable home. Apply, stating age and salary required, to G. R., Messrs. Barclay & Sons, 95, Farringdon St., E.C.

IMMEDIATELY.—An IMPROVER or JUNIOR, well up in Dispensing, for a light Retail and Dispensing business. Must have passed Preliminary. Time could be given for study. Apply, stating age, experience, references, and full particulars, to save time, to J. T. THOMPSON, Pharmacist, Richmond, Yorkshire.

PARTNER and MANAGER.—A thoroughly experienced, energetic and qualified gentleman to take the Management of a London business. Full particulars to bonâ fide enquirers. Those who cannot command £1500 are requested not to communicate. Address, with full particulars and carte, to M. P. S., 981, Messrs. Deacons, Leadenhall St.

OUT-DOOR ASSISTANT. Good penman and address Apply, CHEMIST, 74, New Bond St., London.

A COMPETENT ASSISTANT (early), not under 23 years of age, of good address and experience. Must have good references as to character and ability. One with Minor qualification and desiring a permanent situation preferred. Apply, personally if possible, to W. BOWER, Pharmaceutical Chemist, 96, Tottenham Court Rd., W.

IMMEDIATELY.—A MANAGER, in-door, for a Branch in the N.W. district. Must be competent, qualified, single, and character to bear strictest investigation. Apply, stating full particulars, to L., care of Messrs. Hodgkinson & Co., 198, Upper Whitecross St., E.C.

JUNIOR ASSISTANT in good class Retail and Dispensing business. Apply, stating usual particulars, to P. J. SMITH, 2, Archer Ter., Balham, S.W.

IMMEDIATELY.—An experienced in-door ASSISTANT, who has been accustomed to a good country trade. Abstainer preferred. Apply, stating age, height, salary and references, enclosing carte, which shall be returned, to Mr. SANDILAND, Pharmaceutical Chemist, Bicester, Oxfordshire. A JUNIOR, IMPROVER or TURNOVER also wanted.

SEASIDE.—Immediately.—An ASSISTANT, in-doors, not under 22. One accustomed to a first-class Retail and Dispensing business. One seeking a permanency preferred. Apply, stating age, height, salary required, and references, with carte (to be returned), to E. M. SMITH, The Medical Hall, 34, St. Thomas St., Weymouth.

ASSISTANTS WANTED.

JUNIOR or IMPROVER in a mixed Agricultural trade. Apply, with full particulars, to G. GREEN, Chemist, Alford, Lincolnshire.

AN ASSISTANT, about 23 years of age, for a good country business. In-door. Apply, giving usual particulars, to PHARMACIST, Wright, Layman & Umney, 50, Southwark St., S.E.

JUNIOR ASSISTANT in a good class Retail. He must be industrious, trustworthy, intelligent, strictly temperate, and possess some knowledge of his business. Preference given to a Minor man. Y. P., care of Messrs. Woolley, Sons & Co., Manchester. All replies noticed if accompanied by photo. and references.

MANAGER for a small Retail and Dispensing business in the W. district. Married man preferred. Address ZETA, care of J. Sanger & Sons, Oxford St., W.

JUNIOR, about 19. In-door. At once. Time for study or recreation given to a gentlemanly and obliging ASSISTANT, with good references. Apply, stating full particulars as to age, height, experience, &c., enclose carte if possible (to be returned), FRANK COX, Chemist, Woking, Surrey.

N. JEFFREY & SON, Cheltenham, will require an ASSISTANT in August. One only kept. An abstainer and one who seeks a permanency preferred. Qualification not essential.

S. V. HOLGATE, 29, Long Row, Nottingham, has a vacancy for a Senior ASSISTANT, not under 25. Must be qualified and competent, and accustomed to superior business.

A STEADY, obliging JUNIOR. Apply, with usual particulars, to W. LUFF, Pharmaceutical Chemist, 24, Corn Market St., Oxford.

TWO ASSISTANTS, Senior about 24, Junior 21. Indoors, short hours. For a first class Retail and Dispensing business. Address, stating age, height, references, salary required, also carte (to be returned) to PHARMACEUTICAL CHEMIST, 13, Whitefriargate, Hull.

AS JUNIOR, indoors, in Wholesale, Retail and Dispensing. Age about 22. Hours 8 to 8 and 9 alternately, little Sunday duty. Send age, height, references, salary required, and photo. (which will be returned) to J. BAILEY, Chemist, Coventry.

A PUSHING Gentleman, 25 to 30, indoor and qualified preferred, to Manage a good business, Retail, Prescribing and Dispensing. Able to Extract Teeth. Must have good references from last place. Address, M. P. S., 54, Gt. Mersey St., Liverpool.

IMMEDIATELY. A Junior ASSISTANT of industrious habits. Age about 21. Apply personally or by letter, enclosing carte and usual particulars, to G. B. HATFIELD, Dispensing and Family Chemist, Limehouse, near the Church, London, E.

AN active Junior ASSISTANT. State age, height, references (last situation) and salary required, W. BOTHAM, Pharmaceutical Chemist, 19, Old Haymarket, Sheffield. Also required a respectable well-educated youth as an APPRENTICE. One having passed the Preliminary or its equivalent preferred.

BUSINESSES FOR DISPOSAL.

THE nucleus of a Chemist's BUSINESS, in the finest suburbs in the South of London. 10,000 inhabitants. Formerly used as a surgeon's private surgery, and beautifully fitted up with all new fittings. For a young man desirous of commencing, with limited means, it is a splendid chance. He would also have my patronage and recommendation. For further particulars apply to C., 87, Landcroft Rd., East Dulwich, London.

BUSINESSES FOR DISPOSAL.

A CHEMIST'S BUSINESS. Established over 50 years. Near Elephant and Castle. Shop and parlour only. On very moderate terms, and at low rental. Suitable for energetic gentleman with small capital, or for a medical man with open surgery. Address, N. C., Messrs. Hill & Son, 101, Southwark St., S.E.

A BUSINESS, situated in one of the most rapidly increasing suburbs. Established 3 years. Price very moderate. A good investment for a gentleman commencing. Address in first place, by letter, DELTA, Grosvenor Library, Chapel St., Belgrave Sq.

LIGHT Retail, Dispensing and Prescribing BUSINESS, in a Cathedral town. Returning over £300, and rapidly increasing. Corner shop, in main street. Mahogany fittings and well stocked. Excellent opportunity for energetic man. House large. On lease. Rent £40. Thorough investigation allowed. Good reasons for disposal. Address, P. W., Messrs. Edwards & Son, 157, Queen Victoria St., London.

A MIXED BUSINESS. Established 25 years. Population 30,000. Only four Chemists. Proprietor going into a different line of business. About £200 by valuation, and half might remain. Splendid chance for a Welshman. E. PRICE, Union St., Dowlais.

LONDON, N.—Genuine Dispensing and RETAIL. Returns, 1883, over £800. Established between 5 and 6 years. Long lease. Address for particulars, H., care of Messrs. Burgess, Willows & Co., 101, High Holborn, W.C.

WITH immediate possession.—A small but increasing BUSINESS, in a large and populous neighbourhood of an important watering place. No opposition. For particulars apply to A. S., 45, Kensington Rd., Southport.

IMMEDIATELY.—Cheap. A Chemist's STOCK and FITTINGS, nearly new. Stock includes drugs, chemicals, patent and proprietary articles, sundries. The business is in working order, and a good trade may be done. No opposition for miles. Particulars on application to A. H., Alfred Sinclair, Esq., Vestry St., Leicester.

DENBIGH.—To be sold, as soon as possible, House, Shop, and Premises of Mr. W. EDWARDS, Chemist, 32, High St. The property is freehold, and has an excellent situation, having a frontage of 39 feet to the principal street of this pleasant and thriving agricultural town. The owner has successfully conducted the business for over 30 years, and would sell on very reasonable terms, as ill-health and advancing years make him desirous of retiring at the earliest possible date. For full particulars please address him as above.

MIXED BUSINESS, in manufacturing town of 7000 inhabitants. Neighbourhood of Leeds. Returns £500. Price about £200, or valuation of stock and fixtures. Good reasons for selling. Well worth attention. A., care of Messrs. Goodall, Backhouse & Co., Leeds.

LONDON, N.—A profitable ready money Retail, Dispensing and PRESCRIBING. Returns £6 weekly; capable of much improvement. Rent £50 per annum. 9-roomed house. Vendor going abroad. Will refuse no reasonable offer. Apply to Messrs. TAYLOR & Co., Walbrook Chambers, 38, Walbrook, London, E.C.

NO Goodwill. Vendor disposing of trade in consequence of failing health. Returns about £1000 per annum, with good profits. Established 21 years by vendor. Centrally situated adjacent to tramway terminus and centre, in South Staffordshire town, with a population of over 50,000. Shop well fitted. Good house, side entrance, coach-house, stabling, warehouse, and good yard with lock-up gates. Rent £80. Lease may be had. Personal inspection invited. Stock and fixtures at valuation. Part purchase-money may remain on approved security. Apply, X. F., Wyleys & Co., Wholesale Druggists, Coventry.

BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for tranfer:—SURREY. First-class Dispensing and light Retail. Delightful locality, of daily increasing importance. Showing £540 net profit. Must increase. £1250. Another. Good class Dispensing. Facing station. Returns £600. For £450. 4 miles out, N. Well fitted and stocked Retail. Unopposed. Shows £300 net profit. For £700. DEVON. Facing sea. Retail and Dispensing. Returns £600, by assistant. £500. SOMERSET. Death vacancy. Unopposed Chemist's and Stationery. Returns £800 to £1000. To sell quickly £350. CORNWALL. Through illness. Unopposed Retail and Prescribing. Returns £400. Rent £16. For £120. LONDON (best position in). Dispensing and light Retail. Returns £2250. Net profit £750. Stock and fixtures valued at £1800. For £2200, and half remain. S.W. Good class Retail and Dispensing. Full prices. Returns £800. Net profit £300. Good house, furnished throughout. £1050 everything. S.E. Retail and Prescribing. Full prices. Returns £350. For £280; half remain. Please apply, 30, Jewry St., Aldgate, City. (No charge to purchasers).

ESSEX.—Unopposed. 5 miles from the sea. Retail and Prescribing BUSINESS. Rent £22, on lease. Good 9-roomed house and garden. Returning £600 at full prices. Shop is well fitted and stocked. Price £450, or offer. Thoroughly genuine reliable trade, and offers rare opportunity to anyone wanting nice country unopposed business. Apply to Messrs. BERDOE as above.

LIVERPOOL.—In good thoroughfare and respectable neighbourhood. In same hands 20 years. A well fitted and stocked SHOP. Rent (part let off) under £25. Price £80. May enter for £20 down. Needs only to be seen. Apply, X., 11, Church Rd., Stanley, Liverpool.

CHEMIST'S BUSINESS. Well situated. For sale at valuation—about £250. Parties with little capital wishing to purchase will find this an excellent opportunity, as a moderate deposit only is required, the balance being allowed to stand over to suit purchaser's convenience. Address, CHEMIST, Beal's, East St., Brighton.

ADVERTISER, about taking business in country, has one in town for disposal. A good investment for young man commencing business. Price £150. Open to an offer. Receipts average £5 weekly. Address, C. C., Mrs. Checkland, 2, North Bldgs., Eldon St., Finsbury, City.

WHOLESALE Druggists.—PARTNER wanted, with capital to substitute senior retiring partner. Good sound business of 20 years' standing. Extensive premises, constructed for the trade. Good situation in E.C. London. Apply, by letter at first, G. W. J., Albion House, 326, City Rd.

WANTED TO PURCHASE.

A GOOD country Dispensing BUSINESS. Returning about £600 or £800. Send full particulars as to returns, price, &c., to A. P. S., 31, Charlotte St., Barnsbury Rd., Islington, N.

A FIRST-CLASS Family and Dispensing BUSINESS, returning about £1500 per annum, which will bear the strictest investigation. C. W., 12, Woodview Ter., Manningham, Bradford, Yorks.

FOR SALE.

A MAHOGANY plate-glass Counter Case, 4ft. long, with sloping and flat shelves, as fig. A. 7, £3; a mahogany and plate-glass circular-fronted Counter Case, sloping and flat shelves, as fig. A. 18, 5ft. long, £5; 7ft. long, £6 10/-; mahogany and plate-glass Desk Case, 2ft. 2in. long and 2ft. 2in. high, £2; a quantity of small Show Jars, as fig. D. BYGRAVE, 12, Curzon St., Wenlock St., New North Rd., London, N.

VIZER'S

CHEMISTS' TRANSFER and ASSISTANTS' REGISTRATION AGENCY,

Victoria Chambers, 55, Chancery Lane, London.

MR. EDWIN B. VIZER, Pharmaceutical Chemist, having been engaged in the business for the last 36 years, in London and the provinces, is prepared to offer special advantages to his clients.

Gentlemen desiring to purchase or to dispose of businesses should send early and full particulars. No charge whatever is made for registering such.

The following businesses, among others, for sale:—

LONDON and SUBURBS. N.—Returns £740. Price £700. N.W.—Owner taking a larger business, wishes to realise, hence low price. Returns £430. Price only £250. S.—Returns £290. Price £250. S.E.—Returns £450. Price £450. S.W.—A steadily increasing business. Returns £600. Price £470. W.—Returns £500. Price £350, or offer.

BRIGHTON.—A genuine Family business. Price £350.

DORSETSHIRE.—Returns £890. Price £850.

LANCASHIRE.—Returns £750. Price £625. Another, returning £255. Price £210, or offer.

ISLE OF WIGHT.—Returns £380. Price £200.

No charge to purchasers.

No charge to Vendors unless a sale is effected.

N.B.—The want of a speedy and inexpensive means of communication between Employers and Assistants being a fact of daily experience, a special feature in this Agency is to supply that need by Systematic Registration and Correspondence. A uniform fee of 2s. 6d. is charged to cover expenses until suited. Early Registration is desirable.

Office hours 10 to 4, Saturdays 10 to 2.

HENRY GADD,

Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

97, FORE STREET, EXETER.

H. G. will be happy to furnish intending purchasers with particulars of Businesses from his Register. He has several to offer in Town and Country, to suit large or small capitalists.

Applications for either the sale or purchase of Businesses inserted in Register free of charge.

Mr. EDMUND RUTTER

Arbitrator, Valuator & Chemists' Agent,

4, MELVILLE TERRACE, DEVONSHIRE ROAD, TURNHAM GREEN, W.

Member of the Pharmaceutical Society, and upwards of 30 years' experience. Prompt attention and advice given in all negotiations connected with vendor or purchaser.

TO BE LET.

LINCOLNSHIRE.—To be Let annually, or by lease, an old-established Retail Dispensing BUSINESS, situated in principal thoroughfare and in close proximity to the market place. A three-storied house with a plate glass shop frontage of 22ft. Stock and fixtures at a valuation. Part of purchase-money may remain. Satisfactory reason for the retirement of present owner, in whose family the business has been for the past 80 years. Address, BOULTON, 8, Victoria St., Grimsby.

Midland Counties' Transfer Agency.

F. J. BRETT,

Trade Valuer and Auctioneer,

LEICESTER.

VALUATIONS.—It is essential, to prevent disappointment, that engagements should be made early.

Businesses thoroughly investigated for Buyers.

Purchasers have, at this agency, the advantage of about 300 Businesses to select from, requiring from £100 to £3000 capital.

Probate and Fire Insurance valuations.

MANCHESTER.—Dispensing and light RETAIL, returns about £800, excellent house, price £650.

NORTHAMPTONSHIRE.—Country RETAIL, good house and garden, returns £650, price £350.

CHESHIRE.—Retail and DENTISTRY, returns £500, price £300.

LEICESTERSHIRE.—Light country RETAIL, returns £450, price £275.

LANC.—Retail, Wholesale and PROPRIETARIES, returns £1500, valuation, £800.

LANC.—Rough profitable TRADE, returns £3000, valuation, £1000.

LAKES (near).—Good country RETAIL, returns £630, price £350.

BRIGHTON.—DISPENSING, returns £650, price £600.

NORTH.—Profitable RETAIL, with Agency, returns £1800, price £900.

LANC.—Family RETAIL, returns £1300, price £900, or valuation.

STAFFS.—PRESCRIBING, returns £500, price £300.

LONDON, S.W.—Returns £800, price £800.

LONDON, E.C.—Returns £1500, price £1200.

SALE BY AUCTION.

F. J. BRETT is instructed to Sell by Auction, in one lot, as a "going concern," the light Retail and Prescribing BUSINESS known as 82, Ashton New Rd., Beswick, Manchester, by the vendors, Messrs. Gillett & Co., who are going abroad. To a good Prescriber who will give personal attention this presents an unusual opportunity of securing a nice paying business for a small amount. Sale on Thursday, June 19, at 3 p.m. Cards to view and other details of the Auctioneer.

Transfers, Valuations and Auctions conducted throughout the United Kingdom by Mr. BRETT, Leicester.

Messrs. TAYLOR & CO.

Chemists' Agents and Valuers,

WALBROOK CHAMBERS, 38, WALBROOK,

LONDON, E.C.

Have 308 BUSINESSES in London and the provinces on their Register for disposal.

Gentlemen seeking suitable opportunities for entering business are invited to send particulars of their requirements.

No charge to purchasers.

Valuation appointments for June should be made early.

T. & Co. keep a free Register of employers requiring assistants and assistants seeking situations.

TRAVELLER.

A GENTLEMAN with over 30 years' experience in the Drug and Chemical Trade would undertake to represent a first class Wholesale Drug House in the West of England two or three days per week. Address, W.E., care of JAS. BROWNE & Co., 13, Queen Street, Exeter.

CHEMISTS' TRANSFERS.

32, LUDGATE HILL, LONDON.

MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

PURCHASERS who desire early information regarding eligible opportunities for entering business, will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No 730.] SATURDAY, JUNE 21, 1884. [PRICE FOURPENCE

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NOTICES.

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 11 a.m., on the second **Tuesday** in January, April, July, and October. Candidates must give notice to the Registrar in London on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

Each Candidate must state at which of the following centres he desires to present himself :—

Aberdeen	Cheltenham	Inverness	Norwich
Birmingham	Darlington	Jersey	Nottingham
Brighton	Douglas, Isle of Man	Lancaster	Oxford
Bristol	Dundee	Leeds	Peterborough
Cambridge	Edinburgh	Lincoln	Sheffield
Canterbury	Exeter	Liverpool	Shrewsbury
Cardiff	Glasgow	London	Southampton
Carlisle	Guernsey	Manchester	Truro
Carmarthen	Hull	Newcastle	Worcester
Carnarvon		Northampton	York

Next Tuesday, June 24th, is the last day on which entries can be received for the next Examination.

INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, may be obtained from the Secretary, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

* A Certificate of having passed any of the examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

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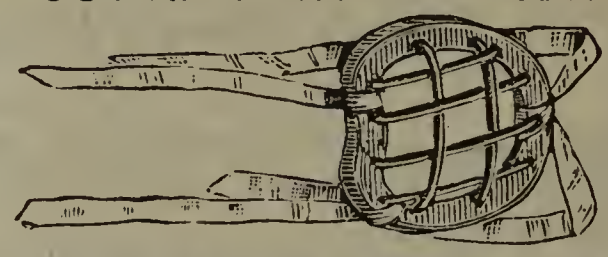

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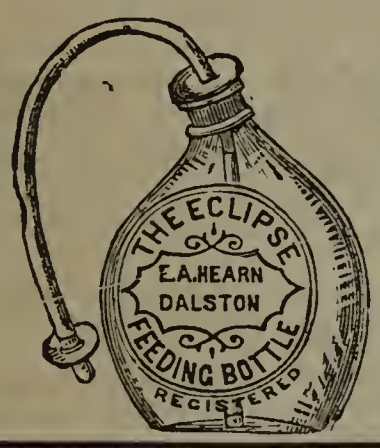

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1	Do. do. 1/- glass bots.	7/-	0	7	0
2	Do. do. 6d. „	4/-	0	8	0
3	Do. do. 3d. „	1/6	0	4	6
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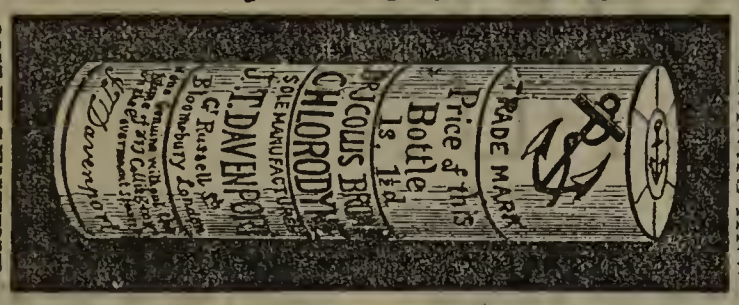

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COUGHS, COLDS, ASTHMA, BRONCHITIS.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY to denote which he coined the word CHLORODYNE. Dr. Browne is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

DIARRHŒA, DYSENTERY. GENERAL BOARD of HEALTH, London, REPORT that it ACTS as a CHARM, one dose generally sufficient. Dr. GIBBON, Army Medical Staff, Calcutta, states: "2 DOSES COMPLETELY CURED ME of DIARRHŒA."

From SYMES & Co., Pharmaceutical Chemists, Simla. *Jan.* 5, 1880.

To J. T. DAVENPORT, London.

DEAR SIR,—We congratulate you upon the widespread reputation this justly-esteemed medicine has earned for itself all over the East. As a remedy of general utility, we much question whether a better is imported, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances *ad infinitum* of the extraordinary efficacy of DR. COLLIS BROWNE'S CHLORODYNE in Diarrhœa and Dysentery, Spasms, Cramps, Neuralgia the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than Collis Browne's, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than Collis Browne's is a deliberate breach of faith on the part of the chemist to prescriber and patient alike.—We are, Sir, faithfully yours, SYMES & CO., *Members of the Pharm. Society of Great Britain, His Excellency the Viceroy's Chemists.*

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IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

Apothecaries' Hall	London.	Gale & Co.	London.	Morson, T., & Son,	London.
Allen, Hanbury & Co.	,,	Giles & Son,	Clifton.	Newbery & Sons,	,,
Baiss Brothers,	,,	Goulding, Messrs.	Cork.	Oldham, G., & Co.	Dublin.
Banks & Richards,	Birmingham.	Grattan & Co.	Belfast.	Parsons & Richardson,	Leicester.
Barron, Harveys & Co.	London.	Grimwade, Ridley,	London.	Peake, Allen & Co.	Dublin.
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Cox & Gould,	,,	Hodgkinson, Tonge & Stead,	,,	Sanger, J., & Sons,	London.
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Davy, M'Murdo & Co.	,,	Hovenden, R. & Sons,	,,	Smeeton, W.	Leeds.
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Dunn & Company,	,,	Lynch & Co.	,,	Tomlinson, Hayward & Co.	Lincoln.
Edwards, W.	,,	Mackay, John, & Co.	Edinburgh.	Treacher, Hodgkinson & Co.	London.
Evans, Lescher & Webb,	,,	Mander, Weaver,	Wolverhampton.	Westwood & Hopkins,	,,
Ferris & Co.	Bristol.	Marsden & Sons,	London.	Woolley, James,	Manchester.
Foulger, S., & Son	London.	Maw & Son,	,,	Wyleys & Brown,	Coventry.
Frazer & Green	Glasgow.	Meggeson & Co.	,,	Yates & Co.	London.

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith, unjust to patient and physician. The *value* of the remedy *alone* creates the great demand.

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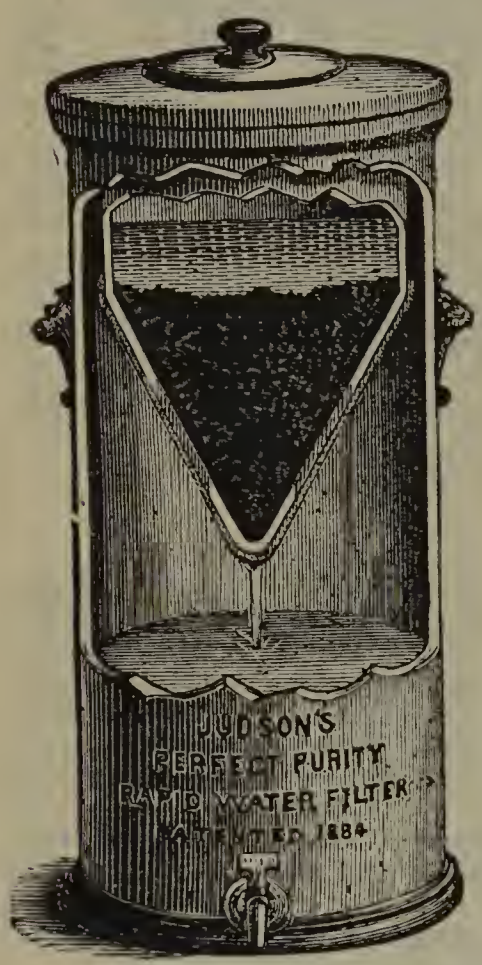

Typhoid, Diarrhœa, Diphtheria

These dreadful diseases are chiefly caused by the consumption of the ordinary water supplied in town and country.

Twelve leading characters of Judson's "P. P." Filter.

1. It is simply constructed on scientific principles.
2. It is not liable to get out of order.
3. It yields water freely and rapidly.
4. It removes impurities from suspension.
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7. It improves the aeration of the water.
8. It may be used for all varieties of water.
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10. It has always given satisfaction.
11. It is superior to all other filters.
12. It is the cheapest as well as the best filter.

These Twelve characters of the Filter are fully treated in Pamphlet, which will be forwarded post free on application.

PRICES OF JUDSON'S "P. P." FILTERS.

Cream Coloured Stoneware.

To hold	1	gallon...	15s.
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White China (Decorated).

To hold	1	gallon...	20s.
„	2	„	30s.
„	3	„	40s.

Liberal Discounts to the Trade.

These prices are for the Filters complete and ready for use, together with sufficient of Judson's "P. P." Medium to replenish the Filter several times.

IMPORTANT.—*These prices are as cheap as is compatible with a good and simple patent Filter. It must be remembered that many of the cheap filters cost a GREAT DEAL every year to renew and keep in order, whereas this filter may be renewed every three months at a cost not exceeding* 8d. *for the year.*

SOLE PROPRIETORS AND MANUFACTURERS,

DANIEL JUDSON & SON, Southwark, London.

The "P. P." Filter may be seen and explained at the above address, or at
Stand No. 421, East Central Courts, Health Exhibition, London.
Pamphlets post free on application.

A NEW GLUCOSIDE FROM STRYCHNOS NUX-VOMICA.

[*First Notice.*]

BY WYNDHAM R. DUNSTAN,

Assistant Lecturer in Chemistry and Physics to the Pharmaceutical Society and Demonstrator of Practical Chemistry in the School of Pharmacy;

AND F. W. SHORT,

Assistant Demonstrator of Practical Chemistry in the School of Pharmacy.

In the course of a complete chemical and botanical investigation of *Strychnos Nux-vomica*, with which we have been occupied for some time past (the results of which will shortly be published), a hitherto unnoticed constituent of the fruit has been discovered, and on further examination proved to be a new glucoside.

The body was first isolated from the pulp in which the seeds lie embedded within the fruit. This pulp has never received a full chemical examination. It was tested for strychnine by Hanbury ('Pharmacographia'), and the presence of this alkaloid definitely shown. In order to fully examine the constituents of nux vomica pulp, it was dried and exhausted with that mixture of chloroform and alcohol (100 : 25) which we have previously shown to be the best and most suitable solvent for extracting the alkaloidal constituents from nux vomica seeds. The exhaustion was effected in the apparatus for hot repercolation and continuous extraction devised by us and described in this Journal (*Pharm. Journ.*, [3], xiii., 633). The chloroform-alcohol percolate as it cooled deposited crystals; these were separated and dissolved in alcohol and the solution spontaneously evaporated. In this way a mass of nearly colourless prismatic crystals was obtained. These crystals fused when strongly heated, then charred, and finally oxidized without leaving any ash; they contained no nitrogen, as was shown by their yielding no sodium cyanide when heated with metallic sodium. A larger quantity of pulp was next exhausted with chloroform and alcohol. The crystals deposited from the solution were thrice recrystallized from ordinary alcohol, and finally again from absolute alcohol. The perfectly colourless prismatic crystals thus obtained were analysed by combustion with lead chromate, when the following results were obtained:—

	Found.		Calculated.	
	I.	II.	For $C_{25}H_{34}O_{14}$.	For $C_{25}H_{36}O_{14}$.
C . .	53·38	53·77	C . . 53·76	C . . 53·57
H . .	6·61	6·59	H . . 6·09	H . . 6·43
O . .	40·01	39·64	O . . 40·15	O . . 40·00
	100·00	100·00	100·00	100·00

It is seen from these results that the formula of the substance which we propose to call *loganin* (Loganiaceæ) is most probably $C_{25}H_{34}O_{14}$, although this formula will require confirmation in other ways, for these empirical results might also lead to the formula $C_{25}H_{36}O_{14}$. The first formula is that given to the glucoside arbutin (from *Arctostaphylos Uva-ursi* and *Pyrola umbellata*) by Hlasiwetz and Habermann (*Ann. Chem. Pharm.*, clxxvii., 339), although, according to Schiff, the substance analysed by these chemists was a mixture of arbutin ($C_{12}H_{16}O_7$) and methyl arbutin ($C_{13}H_{18}O_7$). Habermann has since (*Monats. f. Chem.*, iv., 753) upheld the correctness of the original formula by further experimental results. But, be this as it may, the glucoside from *Strychnos Nux-vomica* is shown to be radically distinct from both arbutin and methyl arbutin, by a much higher melting point, and by not yielding quinol (hydroquinone) or methyl-quinol when acted on by diluted sulphuric acid.

The crystals of loganin lose no water when slowly heated from 100°—180° C. When further heated they liquefy at 215° C., this observation being made with the substance very gradually heated on the surface of mercury contained in a beaker, supported on a non-conductor in an air-bath—in fact, by a modification of the method for determining melting points originally suggested by Professor Redwood. This melting point was redetermined, using a capillary tube sealed at one end, into which the substance was introduced, the tube being slowly heated in a bath of glycerol (glycerin). It was noticed that the crystals softened at 200° C. and become transparently liquid at 215° C. Loganin is easily soluble in water and alcohol, less soluble in ether, chloroform and benzene. The aqueous solution is not precipitated by any of the alkaloid reagents, neither by lead acetate nor silver nitrate; further the solution is not affected by ferric chloride. Loganin develops no colour when acted upon by nitric acid or other oxidizing agents, although it is powerfully oxidized by a mixture of sulphuric acid and potassium dichromate; bromine water is decolorized by a solution of the glucoside. The most characteristic reaction of the substance is found in its behaviour with concentrated sulphuric acid. A very small quantity of loganin, when gently warmed with a few drops of concentrated sulphuric acid, yields a fine red colour, which, on standing, develops into a deep purple. An aqueous solution of loganin does not reduce Fehling's solution. When boiled with dilute sulphuric acid the glucoside is resolved into a glucose (reducing Fehling's solution) and a body which we propose to call *loganetin*. This substance, like loganin, gives the characteristic reaction with sulphuric acid although the purple colour does not develop so rapidly. Loganetin is soluble in water and alcohol, less soluble in ether and chloroform. The aqueous solution of loganetin is not precipitated by silver nitrate or lead actate, nor coloured by ferric chloride. The substance gives no colour when acted on by nitric acid. We are now engaged in a further study of loganetin.

From the amount of loganin obtained from the pulp on which we worked it appears to exist to the extent of from 4 to 5 per cent. in the dried material.

We now proceeded to examine the seeds of *Strychnos Nux-vomica* for the same glucoside, although its occurrence has never been noticed by other observers, nor does any mention of such a constituent appear in the original analysis of Pelletier and Caventou. About one hundred grains of the finely powdered seeds of *Strychnos Nux-vomica* were exhausted with boiling alcohol. The alcoholic solution was treated with tannin to precipitate alkaloid, and the excess of tannin was removed, together with colouring matter, by evaporating to dryness with lead hydrate. The dry residue was exhausted with absolute alcohol; this when evaporated left a small quantity of residue giving the characteristic purple colour which loganin forms with sulphuric acid. The aqueous solution of the residue did not reduce Fehling's solution until it had been boiled with dilute sulphuric acid. In a second experiment the

alcoholic solution of the seeds was evaporated to dryness, extracted with water, and the aqueous solution precipitated by lead oxyacetate. From the filtered liquid the alkaloid was nearly entirely precipitated by tannin. The solution after filtering was evaporated to dryness and extracted with chloroform. When the chloroform was evaporated, a residue was obtained which gave the reaction for loganin with sulphuric acid very distinctly. We have since found that the presence of loganin may be detected with great readiness in the alcoholic extract of nux vomica which is official in the British Pharmacopœia by extracting it with boiling ether, which removes also a little oil with a trace of alkaloid. The residue from the evaporation of the ethereal solution gives the reaction of loganin when gently warmed with sulphuric acid.

It has been shown in this preliminary note that the pulp of the fruit of *Strychnos Nux-vomica* contains to the extent of 4 or 5 per cent. a new glucoside which we have termed loganin, the chemical composition and properties of which have been described. It has also been shown that loganin is contained in small quantity in the seeds of *Strychnos Nux-vomica* and in the pharmaceutical preparations made from them. In the future we hope to be able to indicate the chemical constitution of loganin and loganetin and to discover the relations (if any) of these bodies to the alkaloids strychnine and brucine. The physiological action of loganin will also receive attention. The pulp of *Strychnos Nux-vomica* was collected and prepared for us through the kindness of Dr. W. C. Ondaatje, F.L.S., of Galle, Ceylon, to whose invaluable services in aiding this investigation we shall allude in a forthcoming paper. For this is the least of our obligations to him.

THE ECONOMIC APPLICATIONS OF SEAWEED.*

BY EDWARD C. C. STANFORD, F.C.S.

(*Continued from page* 1012.)

There are two distinct and well defined varieties of kelp:—Cut weed or black-wrack kelp, and drift weed or red ware kelp. Cut weed kelp is the old soda-producing variety, and is made from the three Fuci, *Fucus vesiculosus*, *F. nodosus* and *F. serratus*; these grow on the rocks in the order named, the latter being the most submerged and containing the most iodine, though all contain but little. The plants are cut at low tide, floated ashore, dried and burnt; the weed does not soften much by rain, and it can always be obtained in the fine natural harbours of the West of Scotland and Ireland. This kelp, burnt into a dense fused slag, contained the most carbonate of soda, and was that variety which employed so many poor crofters and cottars, and enriched so many highland lairds. It is now worthless, and the Fuci, which hang from the rocks at low water in luxurious festoons in these lochs, are now entirely unutilized. I have seen 10,000 tons of this weed cut in a single loch, in a few weeks of summer.

The drift kelp is made from two varieties of red weeds, or laminaria, the *L. digitata*, and the *L. stenophylla*, the former known as tangle. Both are always submerged, and are torn up by the violent gales, so common on the west coast; both are sometimes cut in Ireland with long hooks under water from boats. These plants, especially the latter, suffer very much from rain, and are often, after drying, almost valueless; but if well saved, contain ten times as much iodine as the Fuci.

This is the only kelp now used for making iodine, and it ought to be burnt into a loose ash; but although they employ a different material, we have to deal with the same people, and they still insist on raking it into a molten slag, with iron clauts, at great extra trouble, so much so that the men of the family are obliged to do this part of the work, under the erroneous impression that it will weigh heavier, thus mistaking specific gravity for weight; the fact being that they drive off more than half the iodine, and a great deal of the salts, spending several extra laborious hours in reducing the value to a half. It may be asked why we allow it? An incident which occurred to me may answer that question.

Some years ago, when I had to take a large quantity of black wrack kelp in North Uist, it was made to enable the people to pay their rents, and could not then be given up, though it has been since. I tried hard to get some improvement made in the direction of burning the weed at a lower temperature. The people were assembled in great numbers, and the sheriff eloquently harangued them in Gaelic for me. Their objections were threefold: it would not yield so much, it would not be so good and it would take too long. The late Sir John P. Orde, the proprietor, and his factor were present, and it was agreed at last that the most experienced kelper and myself should try the experiment, each to have a certain quantity of weed weighed out to him, and each to burn it his own way. As I expected, my lot was finished first. The yield was 25 per cent. greater, and the product was also, weight for weight, 25 per cent. more valuable. Any one can understand this double advantage of ash *versus* slag. The old man, my opponent, on the result being explained to him, make a remark in Gaelic, which was translated for me as follows:—"I have been making kelp for fifty years and more, and am I to be taught by a young Sassenach with no beard on his face to speak of?" That was the only result of the experiment. How could I explain to him, especially in Gaelic, the difference between specific gravity and weight, to say nothing of quality? As they would not improve the process, the work had to be stopped, and their evidence before the Royal Commission shows how much they have missed it. We took away their clauts, but it was no use; landing once in the middle of the night, I came upon a group hard at work with new irons, raking off the salts, and making themselves hideous, for so intense is the heat, that the soda volatilized gives a strong monochromatic yellow flame which does not improve the beauty of the workers.

To show that this extraordinary idea still prevails, I quote the following from a daily paper, referring to the island of Tyree this year:—

"The men attending the kilns used to turn over the burning mass with iron 'clauts,' but about two years ago the company forbade the use of the 'clauts,' and the kelp is simply reduced to ashes instead of a hard substance. It may be better fitted for manufacture in this state, but it is also evident that it will take more of it to make a ton than by the old process."

It has one advantage for them; being on the sandy shore, or shingle, it enables them to rake in, and embody with the fused kelp a quantity of sand and stones. We sometimes get a block of granite thinly veneered with kelp from our Irish friends, to remind us, I presume, of their national wrongs, and take a slight revenge.

The great heat involves the additional disadvantage that the carbon reduces the sulphates to sulphides, which involve considerable expenditure of oil of vitriol to decompose them, so that sulphur thus deposited is one of the bye-products of the lixiviation of kelp. We are, therefore, compelled to reverse the ordinary process, and manufacture sulphur from sulphuric acid.

The usual yield of kelp from 100 tons of wet seaweed is 5 tons, and as only half of this is soluble, 2½ tons forms the total valuable product of the labour of cutting, carrying, drying, and burning 100 tons of wet seaweed. The burner in many parts, does not receive more

* Read before the Applied Chemistry and Physics Section of the Society of Arts. Reprinted from the Journal.

than £2 per ton, sometimes less, so that all this labour is done for 2s. per ton of weed. When it is also remembered that bad weather often reduces this payment to nothing, it is easy to understand that this occupation is soon given up where any other employment can be obtained. Moreover, the weed is dried in a climate where a native comes up to you with the rain pouring off his hat and nose, and outrages your sense of sight by informing you, if he knows "the English," that it is "a wee misty." The large mass of material to be dealt with, the stormy character of the coasts, the constant moisture of the climate, all tend to still further reduce the quantity obtained. Even with favourable conditions the yield is only 5 per cent., which is quite inadequate to afford profit either to the maker or to the lixiviator.

These evils were fully pointed out in my former paper, and a method was then suggested by which several new products could be obtained, and the whole of the iodine secured. I proposed to submit the seaweed to destructive distillation in iron retorts, thus obtaining a loose, porous charcoal, which retains the salts and the iodine; ammonia, acetic acid and tar were obtained from the distillate. In looking over the tables published in my former papers, some of the diagrams of which are once more on the wall, I notice that the amount of iodine lost in kelp was much under-estimated; much too low a figure having been taken for the produce of iodine. The amount of kelp then made was 10,000 tons in this country, and 24,000 in France; and I estimated the loss of iodine, in this country alone, at 50,000 lbs. annually, it really was about three times that amount, or 150,000 lbs., worth, even at the present low price, £37,500, a sum in excess of the whole value of the additional new products proposed to be recovered.

The Duke of Argyll was the first to see the value of the improvement suggested, and the new process was first carried out in his island of Tyree, in 1863, where works were erected for the pnrpose; soon afterwards works were also erected in North Uist, under an arrangement with the late proprietor, Sir John P. Orde; and more recently in Ireland.

In some respects, Tyree was the best place that could have been selected; in others, the worst. The wildness of its shores, and its numerous outlying rocks, make it the deposit of much drift weed. The inaccessibility and the great difficulty of landing heavy machinery, etc., made the erection of works extremely difficult. The factor calculated that 30,000 tons were used annually for manure, and that four times that quantity was lost. Our calculations were based on recovering 16,000 tons of this, and if even that quantity could have been obtained, the works there would have had a very great success, and turned ont more iodine than all the other Highland shores put together. It is impossible, however, to estimate the amount of seaweed thrown up in a storm, and the sea has an awkward habit of calling again, and removing a good deal of it, or covering it over with sand. This seaweed is also much injured by rain, which soon washes out the salts and iodine. It is a nitrogenous substance, and is quickly devoured by maggots, which become flies, and the material, like some other riches, speedily takes to itself wings and flies away, so that when once I carted a large quantity to the works for experiment, some knowing ones observed that the Sassenach had taken a great deal of trouble to put in the material, but it would not give him any kind of pains to put it out, as it would leave him of its own accord. I may add that it did not; there is nothing so offensive as rotten seaweed, but I had preserved the weed with chloride of calcium. In the winter the long sea rods are thrown up, and these when properly stacked bear a good deal of exposure. There was much difficulty in getting the people to collect these at first, for it was a new thing, and they did not believe in it. They soon found out, however, that it affords winter employment for what they call "a lairge sma' family," and which, to do them credit, most of them possess, as children can work at it. It consists simply in stacking the tangle out of reach of the tide. This work has been going on ever since 1863, and none is lost that can be secured. The works in Tyree and in North Uist are still continued, to the great advantage of the people. For the latter the tangle is also collected in South Uist and shipped to Loch Eport. Both these islands also yielded large quantities of black-wrack kelp, which is now entirely given up.

The works were lighted with the gas obtained by distillation, but after the gas has passed through all the purifiers, it still burns with a strong monochromatic yellow flame. The ammonia obtained is all used as manure for the farm; for whatever other business you follow in these outer islands, you must be a farmer, to feed your horses, etc. The tar is used for the roof of the works; and I may state here, that after great experience of large roofs, many of which have been blown away, I prefer a lattice girder low felt root. No one who has not witnessed a winter gale in one of the Hebrides can form an idea of it. We find it advisable to raise the walls two feet above the girders on each side. I would also mention here that there is no building so efficient or suitable for the damp climate of these outer islands as concrete. The shingle of the shore is always there as the bulk of the material, and cement only has to be sent out. A vessel loaded with quick lime, anchored off one of these islands in a gale, is not a happy or a safe possession, and I know from experience that it does not contribute to the sweetness of sleep.

Iron retorts, heated by coal or peat, were at first used, but these were superseded by brick ovens, which are now employed without fuel. The tangle swells in the retort, and produces a charcoal of great porosity, from which the salts are easily washed out, and there are no sulphides. The residual charcoal is a very efficient decolorizer and deodorizer, but has never been largely used for these purposes. I shall mention presently an application of it.

The following analysis shows the comparison of this charcoal with that from bone. It does not in any way approach the composition of that from wood:—

	Seaweed.	Bone.
Carbon	52·54	11·77
Phosphates	10·92	77·70
Calcium carbonate . . .	15·56	8·43
Calcium sulphate . . .	—	·35
Magnesium carbonate . .	11·34	—
Alkaline salt	5·70	1·09
Silica, etc.	3·94	·66
	100·00	100·00

My experience in the use of peat may be worth recording. I found it give a very fair red heat; we cut and stacked about 600 tons a year of good quality in North Uist, it cost 2*s*. 6*d*. per ton, and I do not think it can be obtained for less. There was no royalty or rent, and the bog was close to the works. It required three times the quantity compared with coal, which greatly increases cost of firing. There is this peculiarity about peat that, where a large supply is required, its cost increases with the quantity collected, because a larger area must be worked.

The winter tangle forms but a small part of the seaweed used for kelp. In the spring and autumn large quantities of Bardarrig or tangle top come ashore, and this is the substance most difficult to deal with. It is ruined for kelp-making by rain, and it will not repay cartage to a long distance. Even washing about in the sea spoils it. To work it by my process would require a large number of small works, which is out of the question, so that it is still mostly made into kelp in the old way, with all its attendant evils. It is this substance which I propose now mainly to deal with. I am convinced that

no process will deal effectually with it unless it will afford the means of removing it to central works, say at Glasgow, involving a cost for carriage equal probably to the cost of the weed, doubling in fact its first cost. There are two ways of removing it, either wet or air dry. I prefer the latter, although I have proved that it can be perfectly well kept in a silo, a specimen so kept for several month having reached me perfectly good, and still containing 83·8 per cent. moisture; and it has been also proved that such a covering of earth as that used for potatoes is an available silo. Most of this material can, however, be got air dry, if, as soon as obtained, it is put in a rick and thatched over, a good deal of it being lost at present while they are waiting for enough to burn into kelp, which cannot be made in a small quantity, and for a way they have of putting it in small stacks to get damp again, because they object to burning it too dry. Twenty thousand tons of this dry material could easily be got in Ireland alone. Four hundred thousand tons of the black wrack was the usual annual collection in the Hebrides in former years, now all unutilized, so that there is ample material if use can be found for it. It is a well known fact that the Fuci grow better when regularly cut.

We are not, of course, limited to Ireland and the Highlands, as any demand for the raw material would open up new and very extensive sources of supply.

The difference between kelp-making and distillation in retorts is shown by the following actual experiment on eight tons of tangle. Four tons were burnt with great care into kelp, and four tons were carbonized in a retort with the following results:—

	Cwt.	Per cent.
Kelp produced	15	18·7
Char „	30	37·5
	Salts. Cwt.	Iodine. Lbs.
Produce of char	8·77	29·25
„ kelp	6·57	13·27
Loss in kelp	2·10	15·98
„ per ton of tangle	0·53	4·00

As a rule the kelp does not contain anything like this. The presence of sand, particularly, adds much to the volatility of the iodine.

A rich sample of seaweed ash, exposed in a platinum capsule over an ordinary Bunsen burner for twenty-four hours, will not retain a trace of iodine.

The sand in kelp is either shell sand, which is mostly carbonate of lime, or flint sand, which is silica; both are highly prejudicial, as the following experiment shows—100 grains of a rich seaweed ash was in each case heated for ten hours over an ordinary Bunsen burner.

	Per cent.	Lbs. per ton.
The ash contained of iodine	·8930	20
The ash after heating ten hours	·4911	11
The ash with 50 per cent. limestone	·3572	8
The ash with 50 per cent. sand	·2235	5

New Process.

The salts made from kelp at present are as follows, taking an average on 20,000 tons:—

	Per ton.
Muriate (95 per cent. potassium chloride)	5 cwt.
Sulphate (75 per cent. potassium sulphate)	1·8 cwt.
Kelp salt (sodium chloride, containing carbonate = 8 per cent. alkali)	3·8 cwt.
	10·6

Iodine, 12½ lbs per ton.

I found, in the first instance, that these salts could be easily extracted from the seaweed, by simple maceration in cold water; the amount so removed from air-dry Laminaria is pretty regularly about one-third of the weight, or 33 per cent., of which 20 to 22 per cent. are mineral salts, and the balance consists of dextrine, mannite, and extractive matter, leaving two-thirds of the plant, or 66 per cent., for further treatment, apparently unaltered.

This residue contains a peculiar new substance, to which I have given the name of algin; and the cellulose; the whole plant being thus utilized.

The comparison between the three processes will, therefore, be as follows, on 100 tons of air-dry Laminaria:—

Kelp Process.

Kelp, 18 tons → Per cent. utilized, 18. → Salts, 9 tons. Iodine, 270 lbs. → Residuals—Kelp waste, 18 tons, valueless.

Char Proeess.

Char, 36 tons → Per cent. utilized, 36. → Salts, 15 tons. Iodine, 600 lbs. → Residuals—Charcoal, 36 tons, tar, and ammonia.

Wet Process.

Water extract, 33 tons → Per cent. utilized, 70. → Salts, 20 tons. Iodine, 600 lbs. → Residuals—algin 20 tons, cellulose 15 tons, dextrine, etc.

Showing that the last process has the first advantage of taking out more salts and iodine from the weed than any other; and these, even at present prices, are sufficient to recoup all the expense of carriage and working. Moreover, in the two prior processes, the residuals are those of the first product, in the last these are from the weed itself.

The water extract is carbonized, and the salts extracted. I append analyses of these; they differ from the kelp in containing no sulphides, and in containing calcium and magnesium salts.

Air Dry (Laminaria stenophylla).

21 per cent. salts.

	Per cent.
Calcium sulphate	1·93
Potassium sulphate	9·72
Potassium chloride	31·97
Sodium chloride	48·67
Sodium iodide	1·79
Sodium hydrate	0·13
Magnesium chloride	5·74
	99·95

Residual Weed (Laminaria stenophylla).

2·32 per cent. salts.

	Per cent.
Potassium sulphate	35·27
Potassium chloride	6·72
Potassium carbonate	5·00
Sodium carbonate	49·97
Sodium iodide	2·63
	99·49

It will be seen that 90 per cent. of all the salts are thus removed, and much of those that remain are products of decomposition. These salts are obtained by the carbonization of the water extract. This is not necessary, and may not be advisable; the salts can be fished out during evaporation. I append analysis of a 2 cwt. sample so fished:—

	Per cent.
Calcium sulphate	1·18
Potassium sulphate	14·20
Potassium chloride	27·81
Sodium chloride	55·11
Sodium iodide	1·69
	99·99

Iodine 32 lbs. per ton.

Also of the mother-liquor 54° Twad. evaporated—

	Per cent.
Potassium sulphate	16·35
Potassium chloride	17·48
Sodium chloride	54·98
Sodium carbonate	5·13
Sodium iodide	5·27
Water	·70
	99·91

Iodine 100 lbs. per ton.

(*To be continued.*)

THE INFLUENCE OF TECHNICAL INSTRUCTION ON CERTAIN BRANCHES OF CHEMICAL INDUSTRY.

The following notes on certain special industries, viz., (1), chemical colours; (2), beet sugar; (3), the alkali trade, upon which the influence of technical education is plainly observable, are contained in the recently issued report of the Royal Commission on Technical Instruction.

I.—*Influence of Technical Training on the Chemical Colour Industry of Germany and Switzerland.*

Among the coal-tar colour works visited by the Commissioners, were those erected on the banks of the Rhine, at Basle, by Messrs. Bindschedler and Busch. These works, though far less extensive than those of Messrs. Meister, Lucius, and Brüning, at Höchst, or of the Baden Aniline and Soda Works, at Ludwigshafen, are carried on in a no less scientific spirit, and the general method of working adopted in all these establishments is identical.

The first principle which guides the commercial heads of all the Continental colour works, is the absolute necessity of having highly-trained scientific chemists, not only at the head of the works, but at the head of every department of the works where a special manufacture is being carried on. In this respect this method of working stands in absolute contrast to that too often adopted in chemical works in this country, where the control of the processes is left in the hands of men whose only rule is that of the thumb, and whose only knowledge is that bequeathed to them by their fathers.

On entering the works of Messrs. Bindschedler and Busch, one is struck, in the first place, with the adaptation of means to ends, with the substantially-built, well-lighted, well-ventilated workshops, and above all, with the all-pervading cleanliness and neatness. But it is not of these things that we now desire to speak, but rather of the method by which their business is conducted. In the first place, then, the scientific director (Dr. Bindschedler) is a thoroughly-educated chemist, cognizant of, and able to make use of the discoveries emanating from the various scientific laboratories of the world. Under him are three scientific chemists, to each of whom is entrusted one of the three main departments into which the works are divided. Each of these head chemists, who have in this instance all enjoyed a thorough training in the Zurich Polytechnic, has several assistant chemists placed under him, and all these are gentlemen who have had a theoretical education in either a German University or in a Polytechnic School. An important part of the system has now to be noticed, viz., that directly under these scientific assistants come the common workmen, who have, of course, no knowledge whatever of scientific principles, and who are, in fact, simple machines, acting under the will of a superior intelligence. The many and great advantages of this arrangement are patent to all; and the fact of having men of education and refinement in positions of the kind, renders the foreign manufacturer who adopts this system less liable to annoyance and loss (from sources which we need not more nearly specify) than his English competitor, who works on a different plan.

So much for the *personnel* of the works. Now for the mode in which they carry on their work. To begin at the beginning, we find no less than ten well-equipped, airy, experimental laboratories in these works, perfectly distinct from the workshops where the manufacturing processes are carried on. In these ten laboratories, the chief departmental chemists and their assistants work out their investigations respecting the production of new colouring matters, or the more economic manufacture of old ones. To assist them in their work, a complete scientific library is at hand, containing all the newest researches, for these, as we have said, form the material out of which the colour-chemist builds up his manufacture, and no sooner do the results appear of a perhaps purely scientific research which may possibly yield practical issues, than the works-chemist seizes on them and repeats these experiments, modifying and altering them so as at last to bring them within the charmed circle of financial success.

Thanks to Dr. Bindschedler, we are able to quote a specially representative case, and a clear description of one such case is worth a host of generalities. Through the original investigations of Messrs. Emil and Otto Fischer, the attention of the manufacturer was drawn to the leuco or colourless base obtained by the action of benzaldehyde on dimethylaniline, inasmuch as they stated that the salts of these colourless bases become green on exposure to air. Founded on these observations, an endeavour was made to effect the practical manufacture of a green colouring matter by oxidation of these colourless bodies. In order to attain the desired end, the following investigations had to be made by the chemist and his assistants who were to conduct the operations :—

(1.) A cheap method had to be found for manufacturing benzaldehyde.

(2.) A profitable mode of making the leuco-base had to be worked out.

(3.) The proper oxidizing agents and their best method of application had to be determined.

(4.) The best method of purifying and of crystallizing the green colouring matter had to be discovered.

The laboratory experiments on the above points having proved so far successful as to give prospects of good results, operations on a somewhat larger scale were started, and these yielding a satisfactory issue, the manufacture proper of the colouring matter, now well known as malachite green, on the technical scale was commenced; all the operations being watched by, and constantly being under the control of the chemists. But even now their scientific work is by no means ended. Continuous laboratory experiments go on for the purpose of finding improvements in the mode of manufacture. Thus, for example, the improved yield, both as to quality and quantity, of the benzaldehyde is a matter of investigation. Again, the synthetic production of the pure leuco-base by a more direct process is sought for, so as to get rid of loss in working, and to obtain a yield as close as possible to that pointed out by theory. In the same way improvements in the materials used for oxidation, and in their application, are made, so as to effect the oxidation quantitatively, without the formation of bye-products. Lastly, the action of various solvents is examined, so as to obtain the best form of the crystallized colouring matter. As indicating the value of these improvements made after the colour became a marketable article, it is only necessary to state that the price of the crystallized oxalate has been reduced from £2 to £1 4*s.* per kilo.

The foregoing may serve to give a picture of a really scientifically conducted works, where each step in advance

is made systematically, as the result of a well-devised plan of operations. This is, indeed, the only means of progress, and this fact is so well recognized in Germany that each of the much larger colour works at Höchst and Ludwigshafen possesses a staff of from thirty to forty well paid and thoroughly trained chemists to conduct their operations. But we are, of course, far from believing that because the methods adopted in these foreign colour works are scientific and productive of good, those made use of in all English works must therefore be unscientific and bad. Taking the whole applications of chemical science we may, no doubt, with truth say that the English industrial chemists have been at least as successful commercially, and certainly as productive in new and important discoveries, as their Continental rivals. The Germans and Swiss, however, have been and still are distinctly before us, not only in the facilities which they possess of obtaining the highest technical training in their numerous Universities and Polytechnic Schools, but what is even more to the point, before us in the general recognition of the value and importance of such training for the successful prosecution of any branch of applied science.

The following statistics give some idea of the magnitude of the colour works of Messrs. Meister, Lucius and Co., at Höchst, near Frankfort, referred to above, and founded in 1862.

The establishment occupies an area of one hundred and fifty acres, of which twenty are covered with buildings. The staff includes fifty-one scientific chemists, fifty foremen, fifteen managers and engineers, and seventy-seven clerks and commercial men, with fourteen hundred workpeople. The works possesses its own railways, forty-one boilers, with a heating surface of four thousand square yards, and seventy-one motors, either steam, water, or gas-engines. The workmen and officials are domiciled in houses belonging to the company, and restaurants, baths, sick clubs, and pension funds have been established for the good of the employés. There is also a fire-brigade with five hand-engines, and one steam fire-engine. The total supply of water, from one hundred and forty-five fire cocks, amounts to 30,000 cubic feet per hour.

In 1882 the products of these works amounted to :—

(1.) 6,600,000 lbs. weight of alizarine.

(2.) 2,200,000 lbs. weight of aniline oil.

(3.) 1,540,000 lbs. weight of aniline, resorcin, and naphthol.

Colours.

The following are the separate products classed together under the last head :—

Aniline and aniline salts.

Fuchsine (no arsenic acid is used in its preparation).

Methyl violet.

Green and blue colours.

Eosin colours.

Naphthol colours.

Alizarine and artificial indigo.

Quinoline derivative (kairin a new substitute for quinine).

Acids.

The most important raw materials employed in manufacturing the foregoing products are as follows :—

40,000	tons	coal.
3,000	,,	tar products.
2,400	,,	caustic soda.
400	,,	potash salts.
2,900	,,	carbonate of soda.
17,400	,,	sulphuric acid.
10,100	,,	various other acids.
1,500	,,	iron borings and filings.
250	,,	wood spirit and spirits of wine.
1,000	,,	various chemicals.
6,800	,,	common salt.
2,050	,,	carbonate of lime.

The whole of the sulphuric, hydrochloric, and nitric acids used, is made on the works.

From about 70 to 80 per cent. of all the aniline colours manufactured are exported, the remainder used in Germany.

About 90 per cent. of the total make of alizarine is exported chiefly to England, but considerable quantities find their way to America, Russia, France, Holland, Spain, and Italy.

One of the most recent and most interesting additions to the above list of products is a derivative of quinoline, termed kairin, lately discovered by Emil Fischer. This substance, which is now being made at Höchst at the rate of about 22 lbs. daily, has been shown to possess important febrifuge properties, even exceeding quinine in activity, and it is not impossible that this artificial product obtained from coal tar may be the means of supplanting altogether the natural alkaloid. The importance of this discovery, should it serve the above purpose, can of course hardly be overrated, and it will then add another and most striking example to the numerous ones which already exist, of the immense importance to the human race of researches in purely scientific organic chemistry, which, at one time, appeared to have no practical value or possible application. It may, therefore, serve again to point the moral, which cannot be too strongly insisted upon, that it is only by the highest and most elaborate achievements of pure scientific investigation that the greatest practical advantages to mankind can be secured.

II.—Influence of Technical Training on the Beet-sugar Manufacture.

Probably no more striking illustration of the rise of a successful and most important industry depending upon the application of the scientific principles of engineering and chemistry can be found than in the Continental beet-root sugar manufacture. The increase in the consumption of sugar in this country has been very great. In 1843 it amounted to 200,000 tons; this figure was doubled in 1854; in 1874 it reached 850,000 tons, and in 1882 1,000,000 tons of sugar were consumed in the United Kingdom. Of these quantities in 1870, 165,000 tons consisted of beet-root sugar, whilst in 1882 the total was over 400,000 tons, valued at £10,000,000. The whole of this amount is imported from Belgium, France, and Germany, as no beet-root sugar is manufactured in this country.

To show the extent and growth of the Continental industry in a small country, we may cite the case of Belgium, with a population of 5,600,000. In 1846 the area under cultivation for beet-root was only 5421 acres; in 1866 this was increased to 44,480 acres, and in 1882 to 86,490 acres. The quantities of raw beet-sugar manufactured in Belgium were in 1880–81 68,000; in 1881–82 73,000; and in 1883 probably 80,000 tons were manufactured in one hundred and fifty-six works; that is, about one ton of sugar is obtained from one acre of beet-root crop. In France and Germany the area of beet crop and the consequent production of sugar is very much larger. The processes of extraction and purification of sugar from beet are complicated and delicate, requiring both scientific knowledge and capital, as the plant necessary for working up the juice into refined sugar is of a very costly character, and the operations require careful and scientific handling in order to ensure success. The juice contains not only sugar crystallizable and uncrystallizable, but also a considerable quantity of inorganic salts and organic substances other than sugar, and the presence of these latter ingredients prevents a large portion of the sugar from crystallizing, and therefore they require to be removed. This removal of the injurious constituents can only be effected when an exact analysis of the juice and of the sugar has been made, and this must be done at each stage of the operation, so that the mode of working shall be properly regulated, and such an investigation is a somewhat complicated process, needing skilled chemical knowledge. The quantity of sugar which is

rendered uncrystallizable by the presence of inorganic salts or ash is about five times the weight of the ash.

In order to obtain the sugar which would otherwise be thus lost, many processes have been adopted, and of these that involving the use of strontia is the most recent. This method was secretly worked for some years in certain works in Germany, but it has now been generally adopted under the patent of Dr. Scheibler, chemist to the Beet-root Sugar Institution. By the use of the strontia process large profits have been made, and the plan has been successfully introduced into France and Belgium. The Continental beet-root sugar manufacture, partly of course in consequence of the Government bounties, has been a very profitable one; annual dividends as high as 100 per cent. having been paid by some sugar-mills. It would seem, however, that owing to the great increase in the number of these establishments, the trade has seen its best days.

The question of the cultivation of suger beet in the United Kingdom, and especially in Ireland, though it has received a certain amount of attention in various quarters, has not come to any practical issue. About 1850, Lord Clarendon, then the Lord Lieutenant of Ireland, ordered an official inquiry on the subject of the growth of beet-root in that country, and the results of that inquiry, presented to Parliament in 1852, showed that 78 per cent. of the beets grown in Ireland were rich enough in sugar to be worked, whilst the corresponding amounts for England and Belgium were 75 and 70 per cent. respectively. At that time the West India sugar had the command of the market; the sugar trade has, however, since that date been revolutionized, but no step has yet been taken by agriculturists and capitalists to commence the growth of sugar beet and the manufacture of beet sugar in this country. To produce the 400,000 tons of beet sugar now imported from the Continent we should need as many acres, but as the beet crop is taken only every three years the total acreage required would be 1,200,000. A large proportion of this, if not the whole of it, could be found in Ireland, and there can be no doubt that the introduction of such an industry would do much to improve the general agriculture of that country.*

[For further information on the Belgian Beet Sugar Industry, see paper by M. Melin, of Wanze, read before the Liége meeting of the Institution of Mechanical Engineers, 1883.]

III.—Influence of Technical Training on the Alkali Manufacture.

The beneficial action of high scientific and technical training upon the chemical colour and beet sugar industries having thus been shown, it becomes of interest to examine the effects of such education on another no less important branch of chemical manufacture, viz., the alkali trade, and in this instance the comparison of the relative position of the Continental and English works is by no means all in favour of the former. In the first place, as regards the workmen themselves, it may be truly said that in no country does any real amount of scientific education reach the ordinary workmen in alkali works, who are rather labourers than artizans. Moreover, the foremen, both in this country and abroad, are almost invariably men who enter the works either as laboratory boys or as ordinary workmen, and who have risen by virtue of industry and native intelligence, but who have had no scientific training beyond that afforded by the occupation in which they have been engaged. So far, therefore, as the education of the workmen employed in alkali works is concerned, the foreigner has no advantage over us, nor have we any over the foreigner. In the case of the managers and proprietors the matter is, of course, different. On the Continent nearly every manager of a soda works is a man of a very high degree of scientific attainment,—a highly trained engineer, and a highly trained chemist. An English manager, one at least of the older school, on the other hand, is scarcely ever a man who has had a similar training to that of Continental managers before they enter upon the duties of management. The Continental alkali makers are men of wider knowledge and of more extended scientific attainments than their English brethren. Thus, whilst probably none of our English alkali makers could discuss the chemistry of the latest organic colouring matter, nearly all the Continental masters are able to do so. But in the opinion of those best qualified to judge, and speaking of course of the managers of the first class works in each case, there is no doubt that the English alkali makers are just as well acquainted with the scientific bearings and relations of their own manufacture as their Continental rivals. Nor is the foreigner a better alkali maker than the Englishman, for even in cases in which the former obtains better results than are usual in this country, as regards economy of fuel and raw material, the cause is to be sought rather in the fact that his cheaper labour permits him, and his dearer fuel and raw materlal compels him, to do what dear labour and cheap fuel and material absolutely forbid to the English alkali maker, than in any superiority in scientific training of the one over the other. It certainly cannot be said that the English soda industry suffers in comparison with that of the Continent, owing to the want of scientific knowledge on the part of those who conduct it. Men of the highest talent and most eminent for their scientific knowledge are found in all our large alkali works, and it is a remarkable fact that with one or two exceptions, everything in the way of important improvements in the alkali manufacture by the Leblanc process has originated in England. Hydrochloric acid condensing towers, revolving black-ash furnaces, Glover-towers, mechanical calcining furnaces, mechanical salt-cake furnaces, plus-press furnaces, and last but not least, the Weldon plant; each one of these English improvements marks an era in the alkali manufacture, and has been at once adopted as a necessity by all manufacturers. Even the well-known ammonia-soda process, first successfully worked in Belgium, is chemically an English invention (Dyer and Hemming), though made industrial by a Belgian (Solvay). No less remarkable is it that, certainly often in England, and in some cases abroad, those men who have made the most important improvements or discoveries in the alkali manufacture have been self-taught, proving the truth of the axiom that a scientific education cannot stand in place of natural sagacity and workshop training.

It is the opinion of those intimately acquainted with the present condition and future prospects of the alkali trade, both at home and abroad, that such differences as exist between the results obtained on the Continent and at home, are due to differences of national character and local circumstances rather than to a superiority of scientific education, and it may be questioned whether many Continental alkali works could survive in face of English competition, if the import duties by which they are at present protected were abolished.

* The sugar factory of Mr. Duncan, established some years ago at Lavenham, and which was not successful, is about to be reopened. The use of strontia and other improvements in the manufacture, together with lower railway charges on the roots, encourage the new proprietors to anticipate better results.

FAILURE OF THE CINCHONA CULTIVATION IN ST. HELENA.

Following closely upon the unfavourable report upon cinchona cultivation in Ceylon, to which we referred last week, a report has been received from Mr. D. Morris, Director of Public Gardens and Plantations, Jamaica, on the Present Position and Prospects of the Agricultural Resources of the Island of St. Helena, which records the practical collapse of the cinchona acclimatization experiment in that island. Mr. Morris gives the following

detailed account of the various attempts and their results:—

"The proposal to introduce the cultivation of cinchona into St. Helena appears to have been made, in the first instance, by the late Dr. Roxburgh, who, as far back as 1814, recommended that seeds of *Cinchona officinalis* be obtained from South America, and that after plants had been established at St. Helena they should be transmitted to India.

"Sir Joseph Hooker, having on two occasions, namely, in 1839 and 1843, had favourable opportunities of forming an opinion respecting the resources and climate of St. Helena, when Sir Charles Elliott in 1864 began to develop planting operations in the island by the introduction of new and valuable plants, it occurred to him that cinchona, if properly tried, was likely to lay the foundations of a remunerative and successful industry.

"To undertake experiments a skilled gardener, Mr. J. H. Chalmers, was sent out from Kew in 1869, who, having been supplied with seeds, succeeded within a short period in raising several thousand cinchona plants in nurseries at Plantation House. Soon after a nursery was established at Newfoundland (altitude 2400 feet), in the immediate neighbourhood of the highest peaks and of the only uncleared natural forest remaining in the island.

"Mr. Chalmers succeeded altogether in raising about ten thousand plants from seed; and of these possibly more than one-half were planted out either on the slope above Newfoundland and under Actæon's Peak; or, on the Peak itself.

"This portion of the island, it may be explained, lies along the inclines of the central ridge, of which Actæon's Peak, Diana's Peak, and Cuckold's Pit Peak form the culminating points. The general elevation is between 2500 and 2700 feet; the mean annual temperature rather below 60° Fah.; and the soil composed of a rich black vegetable mould—peat—overlying marl or decomposed volcanic rock. At this elevation the ridge is bathed in moisture for at least three days of every week; and thus favoured, as pointed out by Sir Charles Elliott, it has become covered with a luxuriant growth of ferns and other plants usually found in the home of cinchonas in South America.

"The prospect for cinchona at first was full of promise; and indeed if the cultivation had been attempted at an earlier period when there was a larger area of indigenous forest to select from, and when plantations might have been established on the northern and more sheltered slopes of the central range the results might have been very different.

"As it was, the plants put out on the terraces at the foot of Actæon's Peak began to die off, and, driven to a last resource, the cultivation was ultimately confined to the narrow ridges of Actæon's and Diana's Peak, which, in many places, are only a few feet wide and fully exposed to the strong trade winds which usually blow in St. Helena for about nine or ten months in the year. Here the soil on the surface was of a promising character, being composed of rich vegetable humus formed by the decayed leaves and stems of tree-ferns and native plants. Below, however, there was nothing but a cold, wet, indurated or slightly friable marl, very unsuitable for the growth of cinchonas, and which in Ceylon and India is known by experience to develop rot or canker in the roots, and to destroy every plant in contact with it. In his last report on the subject, dated December 12, 1871, Mr. Chalmers rightly attributes the large percentage of losses amongst his plants to the superficial nature of the soil, and reports that 'they invariably died soonest in shallow ground, and, on the contrary, lived longest where the soil was of greatest depth.' Further, he remarks, 'there is nothing, either in the climate or situation, of an unsuitable character; the soil alone seems to be at fault, being insufficient for the further development of the plants.'

"Out of about five thousand plants put out by Mr. Chalmers between January, 1869, and November, 1871, at the latter date there were only five hundred and forty of all ages then remaining. These were as follows:—

Cinchona succirubra, over 2 feet	. . . .	221
" " 6 "	. . . .	84
Cinchona officinalis " 2 "	. . . .	81
" " 6 "	. . . .	3
Number of both kinds under 2 feet	. . .	151
Total	. . .	540

"Further experimental trial was stopped by the reduction of the establishments effected by the late Admiral Patey, and Mr. Chalmers left the island.

"From 1872 up to the date of my visit the cinchona trees still living had received some attention, but practically their cultivation was abandoned.

"I went up to the central ridge with the Governor and Colonel Phillips, R.E., on July 31, and spent the day examining the soil and noticing the condition and state of the cinchona trees still remaining.

"Of the trees planted by Mr. Chalmers there were forty fine trees of *C. officinalis*, from 8 to 20 feet high; of *C. succirubra* there were one hundred and sixteen trees, from 8 to 20 feet high. The largest tree of all was a red-bark tree, *C. succirubra*, which measured 18 inches in circumference at 1 foot from the base. Except a few trees in exceptionally sheltered spots, they were all much damaged by wind, and presented a stunted and half-starved condition.

"The ridge on which they were growing formed a portion of the rim of the old volcanic crater of Sandy Bay. On the southern side there was a steep, almost perpendicular, wall of rock, about 100 to 250 feet deep, reaching down to broken lands and ravines clothed with ferns, briars, and the low, bushy growths of cabbage trees, jelico, wild olive and lobelia. On the northern and western sides the slopes, in places, were somewhat easier, but in no place was the ridge more than about 20 feet or 30 feet across. In many places, indeed, it was so narrow that it appeared like an old castle wall, clothed with vegetation.

"The length of the ridge on which cinchona had been attempted was altogether under $\frac{1}{4}$ mile in a direct line.

"Under the most favourable circumstances it was not possible to place more than about 5 or 7 acres under cultivation in cinchona; but in view of the very unsuitable nature of the subsoil and the large mortality which had taken place amongst the young plants, it is very undesirable to attempt any further experiments. According to the statement of a very intelligent native gardener, trained by Mr. Chalmers, who has been employed since at Plantation House and is occasionally looking after the cinchona plants on the ridge, more than 90 per cent. of the plants put out were lost owing to the unsuitable nature of the soil.

"I visited the ridge again on August 1, and spent the day in exploring the lands in the immediate neighbourhood of the peaks, with the view of finding land offering better facilities for cinchona planting than the ridge itself. In this I was disappointed. Except on the crest of the ridge there is no vegetable deposit or surface soil likely to grow cinchona, the soil elsewhere being very shallow and immediately overlying rock or cold impervious clay.

"Summing up the results of my inquiry, I am of opinion that, while the first impressions were favourable to the possibility of growing cinchona on the highest peaks in St. Helena, the character of the subsoil, together with the exposed position of the locality, would entirely preclude the undertaking being commercially a success; and on other grounds it would be very undesirable to cut down any more of the indigenous forest, which already is reduced to such a small extent."

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HAY FEVER.

ABOUT this time of the year many persons suffer severe inconvenience from a complaint which does not appear to have been recognized by the medical faculty as a definite form of disease until the earlier years of the present century. It has been defined as a peculiar affection of the mucous membrane of the nose, eyes and air passages, giving rise to catarrh and asthma, and is referred to generally under the name of "hay fever," though it is also variously termed "hay asthma," "pollen catarrh," "summer catarrh" and "rose catarrh." Whether the silence of the older medical writers upon the subject is to be attributed to the disease having been confounded with others that it resembled more or less closely, or whether it is a penalty attendant upon an advance in civilization, and marks an evolutional increase in the sensitiveness of the olfactory organ since the time when the patriarch failed to discriminate between the odour of the skin of the kid of a goat and the smell of a field, is not altogether clear; at any rate the first detailed account of hay fever was not published until the year 1819, whilst perhaps the most interesting contribution to the literature of the subject was made only a short time since by DR. MORELL MACKENZIE, in a lecture delivered at the London Hospital Medical College, and published in the *British Medical Journal.** Few, however, as have been the years during which the etiology of the disease has been systematically studied the theories as to its determining cause have been many. Effluvia from grass or hay, heat, and especially the first heat of summer, the continuous action of light, dust, excess of ozone in the atmosphere, the influence of benzoic acid, coumarin and other volatile compounds, have all been put forward as causes with more or less plausibility; but most of them have been put out of court by known facts. For instance, in the United States hay fever is much more common in autumn than during the almost tropical summer; it does not occur at sea in the most sultry latitudes, whilst it is hardly known in the "land of the midnight sun," where the light lasts during the longest periods continuously; neither is it produced by the inhalation of air highly impregnated with ozone. In the opinion of Dr. MACKENZIE, however, it has been clearly demonstrated by the experiments of Mr. BLACKLEY, of Manchester, that the cause of hay fever is the action of plant pollen on the mucous membrane.

In the experiments made by Mr. BLACKLEY, upon himself and others, he found that the inhalation of air containing pollen always produced the characteristic symptoms of hay fever, and that there was a direct relation between the intensity of the symptoms and the amount of pollen suspended in the air inhaled. This result is quite consistent with the common belief that the affection is produced by emanations from plants, although the bad name given to the sweet-scented vernal grass (*Anthoxanthum odoratum*) and the holy grass (*Hierochloe borealis*) seems to be based principally upon their more demonstrative fragrant odour, since there is no reason to suppose that their pollen is more active than that of the fox-tail grass (*Alopecurus pratensis*) or those of various species of *Poa* and *Lolium*. The pollen of rye is still more potent, and those of wheat, oats and barley are also very active. Indeed, the chief culprits, in this country at least, seem to be members of the grass family, and careful observations made by Mr. BLACKLEY led him to the conclusion that 95 per cent. of the pollen occurring suspended in the atmosphere in England during the prevalence of hay fever is derived from the Gramineæ. Plants of this order come into blossom between the end of May and the latter part of July, which is precisely the period of the year when hay fever prevails. In America, however, the pollen of a Composite plant, the Roman wormwood (*Ambrosia artemisifolia*) is thought to be the most common cause of the disease. This plant blossoms in August and September, which is precisely the time that hay fever is most prevalent in North America. Besides the exciting causes of this disorder, however, Dr. MACKENZIE recognizes the existence of a predisposing idiosyncrasy in certain persons, and among the circumstances supposed to influence this idiosyncrasy, race, temperament, occupation, education, mode of life, sex, heredity and age are enumerated. The influence of race appears in the fact that almost the only sufferers from hay fever are English and Americans, for natives of other countries resident where the disease prevails are rarely affected, it being never met with among Germans or French in New York, in which city it is comparatively common at certain seasons. On the other hand, in Asia and Africa only the English suffer from it. The nervous temperament appears to be a predisposing cause, whilst it is most singular that the complaint is almost exclusively confined to persons of some education and generally to those of fair social position. The rustic is much less subject to it than the citizen, and a larger proportion of men suffer from it than women. The idiosyncrasy is also undoubtedly

* The lecture has been reprinted in the form of a shilling pamphlet, which is published by Messrs. Churchill.

hereditary and becomes manifest in the majority of cases before the age of forty.

It is admitted that at present the treatment of hay fever is unsatisfactory, and that it is better for persons subject to it to keep themselves out of the way of possible excitants than to rely upon obtaining relief by the use of drugs or otherwise when the complaint has once been set up. When, however, it is necessary for such persons to remain exposed to the perils of a pollen-infested neighbourhood, the plugging of the nostrils with cotton-wool, the protection of the eyes by specially constructed spectacles, or the wearing of a gauze bag drawn over the head, somewhat after the *mode* of the veiled prophet introduced to the English-reading public by THOMAS MOORE, are among the protective artifices recommended. As has been mentioned, persons who suffer from hay fever are most commonly of nervous temperament: nerve tonics and other constitutional remedies, such as quinine, arsenic, opium and belladonna, have therefore been employed to ward off or to control attacks. Dr. MACKENZIE states that he has found pills containing one grain of valerianate of zinc and two grains of compound asafœtida pill more useful than any other remedy, the pills being ordered to be taken as the hay season approaches. When the disease is established, tincture of opium in doses of five to seven drops twice daily, and a saline purgative, have been found useful in reducing the secretion, diminishing the sneezing and bracing up the system. The diet should be at the same time nutritious and easily digestible. Dr. MACKENZIE trusts very little to local applications for the relief of the complaint, since many of those recommended appear to be apt to intensify the disease, especially those of quinine and salicylic acid, the recommendations of which appear to have been based upon the assumption that the complaint is due to bacterial agency. He says, however, that when there is profuse secretion with an excessive tendency to sneeze the inhalation of strong ammonia salts often gives great relief, while a soothing effect sometimes follows the inhalation of a "vapour" prepared from compound tincture of benzoin or the insufflation several times a day of a powder containing one-sixteenth of a grain of morphia and one grain of bismuth. For the relief of the irritation of the eyes a lotion containing two grains of acetate of lead and two drops of acetic acid to an ounce of water has been found useful, or a sedative collyrium containing acetate of morphia may be dropped into the eye. The symptomatic phenomena of hay fever are fairly characteristic, and the points in which they differ from those of common catarrh on the one hand or spasmodic asthma on the other have now been clearly made out. For a description of them the reader cannot do better than turn to the lecture that has been the occasion of this notice. It must suffice here to say that hay fever usually comes on very suddenly, varies considerably in its intensity and duration, apparently in direct proportion to the abundance of the *materies morbi*, is marked by a characteristic œdematous puffiness of the eyes, and as a rule first attacks its victims in the daytime and in the summer.

The Registrar has received from the Privy Council Office a copy of an Order in Council of the 11th inst., confirming the appointment of Mr. W. H. Symons as a member of the Board of Examiners for England and Wales.

* * *

We have been favoured by Dr. Murrell with a copy of the programme of the arrangements, so far as completed up to the present time, for the business of the new Section of Pharmacology and Therapeutics of the British Medical Association, at the meeting to commence in Belfast, on the 29th of July. From this we learn that the President of the Section, Dr. Thomas John Maclagan, of London, proposes to move, at the conclusion of his Introductory Address, a series of resolutions relating to the "British Pharmacopœia" and the "Patent Medicines Stamp Act," which will be supported by the Vice-Presidents, Dr. Matthew Hay, of Aberdeen, Dr. Walter Smith, of Dublin, and Dr. William Whitla, of Belfast. An expression of medical opinion upon these two subjects, such as may be expected in the subsequent discussion, can hardly fail to be of considerable interest at the present juncture, especially as it may be supplemented by that of pharmaceutical chemists, several of whom have been invited to attend the meetings of the section and take part in the debates. Amongst the other business that is to be brought forward, there is to be a debate on Antipyretics, to be opened by Dr. Alexander Collie and Professor Quinlan; Dr. Dujardin-Beaumetz, Dr. Thursfield, Dr. Boys and Dr. Currie are to read papers on New Antipyretics; there is also to be the special debate on Indian Drugs, to which we referred last week; and Dr. Shoemaker, of Philadelphia, is to give an explanation of the *modus operandi* of the New Oleates which have been associated with his name.

* * *

The Bill to regulate the practice of pharmacy in France appears to share the experience of the attempts to legislate for medicine and pharmacy in this country. The Bill has been included among the orders of the day since the last week in May, without making progress, and a day or two since it was still as low down as No. 34.

* * *

A short Bill to extend the operation of the Factory Acts to shops, which has just been introduced into the House of Commons by Sir John Lubbock, contains some provisions that might prove very inconvenient if allowed to pass into law without modification. One of them would make it illegal to employ "a young person," *i.e.*, a person under eighteen years of age, during more than twelve hours or later than eight o'clock in the evening of any working day of the week, except one, the limit of which is fixed at ten, whilst on one day the working hours are not to exceed seven and not to terminate later than five in the evening. Another provision would make it illegal to employ "a young person" in a shop at all on Sunday. It is evident that both these provisions would clash very much with the arrangements under which, at present, the public is, in many places, supplied with necessary medicines.

At the last meeting of the Board of Pharmacy of the city of New York a report was presented stating that there were then 2019 registered pharmacists in the city, 860 of whom were proprietors of pharmacies and 1159 assistants. During the three years in which the Board had held office it had examined 107 candidates, of whom 63 failed to pass. There had also been about three hundred prosecutions for the offence of dispensing drugs without a certificate.

* * *

The experiment of raising a supply of medicinal plants in the Government Botanical Gardens in Ceylon appears to have met a fair amount of success. At Hakgala jalap plants have grown most vigorously, and although at the time of the report very few tubers had been found, the bed was full of underground stems by which the plant could be propagated. The few tubers had, moreover, grown to a large size, one that was taken up weighing sixteen ounces. As, however, in the Nilghiris the best results are obtained at an elevation of 7000 feet, whereas at Hakgala the elevation is only 5400, it is thought probable that this may be the explanation of the tendency of the plants to make more leaf and less tuber at the latter place. Tinnevelly senna (*Cassia angustifolia*, var., Vahl) has succeeded perfectly at Anuradhapura, from whence good samples of the drug were sent to the Agri-Horticultural Show in Colombo in August last. Seeds of Mecca senna (*C. acutifolia*, Vahl) have also done well. Beds of seedlings of *Rheum palmatum* and *R. officinale* have been made at Hakgala, but though the crowns look plump and healthy, the plants make little growth. Still as the common garden rhubarb does well, it is thought that the medicinal plants may succeed if kept going until somewhat acclimatized. At Hakgala, too, the chamomile has become thoroughly established and can be increased to any extent. Taraxacum has not, however, done quite so well, the soil being too poor, and the plants having been eaten down by elk. A considerable quantity of fair-sized roots were, however, available for the use of the Medical Department.

* * *

Mr. Bowen, who for the last five years has presided over the Pharmaceutical Society of Victoria, having declined to accept the position for a fresh term, the Council of the Society, at its meeting in April, elected Mr. Huntsman as President. The new Vice-President is Mr. E. G. Hooper, whilst Mr. Gamble and Mr. Shillinglaw have been unanimously re-elected Treasurer and Honorary Secretary respectively. It was reported that twenty-eight students were attending the College of Pharmacy.

* * *

Notwithstanding the declining value of the cochineal crop in Teneriffe, to which we recently referred, it appears from a recent report by Brigade-Surgeon Bidie, that the Indian Government has decided to obtain a supply of cochineal insects from Algeria, with a view to introducing their rearing as an industry into Madras. The fodder and resting plant for the insects to be experimented with is the local prickly pear (*Opuntia Dillenii*), on which, according to Roxburgh, they thrive and multiply.

* * *

According to a recent return there were in the Dutch Government plantations and nurseries in Java, at the end of last year, 3,299,500 cinchona trees, showing a slight decrease as compared with the previous year; in respect to the "Ledgeriana" plants however, there had been a considerable increase. The surplus seed from the Government plantations is now sold by auction at Bandong, and in consequence of the increasing cultivation of the cinchona by private enterprise in Java it has been in considerable demand. At the first auction as much as 20 fl. per gram was paid for some lots of seed from the original "Ledger" trees.

* * *

Referring to the subject of the leaves of a plant, mentioned on p. 976, as being smoked by the natives of Angola, we are informed by Mr. J. R. Jackson, the Curator of the Museum of the Royal Gardens, Kew, that the hemp (*Cannabis sativa*, L.), is no doubt the plant meant, as it is well known on the west coast of Africa under the name "liamber."

* * *

M. Jamin has been elected to succeed the late M. Dumas as Perpetual Secretary to the French Academy of Sciences by thirty-nine votes against twelve votes given to the other candidate, M. Vulpian.

* * *

It has been announced that a new 'Flora of Oxfordshire' is being prepared by Mr. G. Claridge Druce, which is to be not only a catalogue, but a history of Oxfordshire plants and of the botanists connected with the University and County. Mr. Druce, who is a pharmaceutical chemist, residing in Oxford, and whose name will be familiar to many of our readers, has been promised access to manuscripts and herbaria in the possession of private individuals as well as the active assistance of many eminent botanists; but we doubt not that he will be glad also to receive from fellow pharmacists any information on the subject they may be able to place at his disposal.

* * *

A note in the *Répertoire de Pharmacie* mentions the occurrence of a quantity of tartrate of ammonium (probably the acid tartrate) in a sample of codeine. The tartrate resembled the codeine in its external appearance; it was crystallized in hard rhomboidal prisms, slightly soluble in cold water, but dissolving readily in boiling water, yielding a solution with an acid reaction. The salt is insoluble in alcohol, which property first led to the detection of the admixture and facilitated its separation from the codeine.

* * *

According to the *Pharmaceutical Record* the New York Board of Fire Commissioners has been compelling retail druggists to pay a licence tax of two dollars for keeping "ether, nitrate of silver, and a few other combustibles and explosives." The imposition has, however, been resisted by one druggist, who has obtained a legal decision in his favour, but against this the Board has appealed to a higher court.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, June 26, at 8 p.m., when a "Further Report on the Purification of Crude Antimony Sulphide" will be made by Mr. A. J. G. Lowe. A Report on Physics will be made by Mr. H. Allen, B.Sc., and a "Note on Eykman's Process for the Estimation of Ethyl Nitrite," will be read by Mr. T. S. Dymond.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

June 18, 1884.

Present—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Southall, Symons, Tanner, Taylor and Thresh.

MAJOR EXAMINATION.

Seven candidates were examined. *Three* failed. The undermentioned *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Blain, Alfred Lucas.....Bolton.
Burnett, Joseph Fearon .....Hyde.
Prothero, George Rees.....Pontypridd.
Steward, Josiah William .....Bridgnorth.

MINOR EXAMINATION.

Twenty-five candidates were examined. *Seventeen* failed. The undermentioned *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Astley, Frederick Aspinall.....St. Anne's-on-Sea.
Barker, George.....Mirfield.
Britton, William Brannam.....Barnstaple.
Bunn, James Early Smee .....Halstead.
Cullinan, Edward.....London.
Davies, Charles Gardiner .....London.
Earle, Ernest Haworth .....Hull.
Evans, John Richard .....Dowlais.

June 19, 1884.

Present—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Corder, Ekin, Fletcher, Gale, Linford, Plowman, Southall, Symons, Tanner, Taylor and Thresh.

Dr. Greenhow attended on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-nine candidates were examined. *Twenty-one* failed. The undermentioned *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Burnby, John James .....Bardney.
Heron, Frederick Chambers ...London.
Johnston, William .....Montrose.
Jones, Llewellyn J. W. .....Swansea.
Saul, John Edward .....Rock Ferry.
Sloan, William Guley ....Barking.
Stevenson, George .....Hucknall Torkard.
Watson, Arthur John .....Great Bridge.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificates of the College of Preceptors.

Bridgwood, Walter Stuart .....Birmingham.
Jefferson, John.....Carlisle.

Certificates of the University of Cambridge.

Poole, Jeffrey ....Birmingham.
Riches, Frank Fraser .....Torquay.

Certificate of the University of Oxford.

Kingzett, John Frank .....Weston-sub-Edge.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly stated meeting of the Council was held on Wednesday, June 4.

Present—Mr. James E. Brunker, M.A., President, in the chair; Messrs. W. N. Allen, Thomas Collins, M.R.C.S.E., Alexander E. Doran, John Evans, L.A.H., William Hayes, E. M. Hodgson (Treasurer), Robert Montgomery, L.A.H., M.R.C.S.E., Robert Simpson, and Aquilla Smith, M.D.

The Registrar read letters from Sir W. V. Harcourt, Home Secretary, and Sir R. H. Collins, thanking the Council for its vote of condolence with the Queen and the Duchess of Albany in their bereavement, which were ordered to be inserted on the minutes.

The Registrar read a communication from the Pharmaceutical Society of Great Britain, stating that after consideration of the circumstances mentioned in Mr. Fennell's letter of February 20, the Society had resolved to accept the offer contained in that letter, and would supply copies of the *Pharmaceutical Journal* to the members of the Society for an annual payment of £20.

The President said this arrangement was on the understanding that the number of members would not exceed about sixty. The Pharmaceutical Society of Great Britain had acted very liberally in this matter.

Mr. Hodgson (Treasnrer) moved—

"That the thanks of this Society be given to the Pharmaceutical Society of Great Britain for supplying the *Pharmaceutical Journal* to our members on the liberal terms mentioned in their letter of April 5, read this day."

Seconded by Mr. Doran and agreed to.

The Registrar read a letter from Mr. G. O. Trevelyan, Chief Secretary for Ireland, acknowledging the receipt of the statement sent by the Council of their views relative to the amendments sought for to the Pharmacy and Poisons Acts.

The President said letters had also been received from other members of Parliament, acknowledging the receipt of the statement sent by the Council. Among them were Messrs. Gibson, M.P., and Plunkett, M.P., both of whom promised to attend to the matter whenever the Bill came before the House of Commons.

A letter was read from Mr. William H. Greer, Belfast, stating that he purposed shortly to present himself for the Society's Final examination, and asking the Council to accept a certificate from Dr. Frankland of his having attended a course of instruction in practical chemistry at South Kensington, although not one of the institutions mentioned in the Society's regulations.

The Registrar was directed to inform Mr. Greer that the Society had no power to accept the certificate of South Kensington without the authority of the Privy Council, but that application would be made to obtain such authority as soon as possible.

The Registrar read a communication from Mr. J. P. Middleton, of Hardwick Street, Dublin, re-submitting a certificate for practical pharmacy given him by Mr. G. H. Grindley, for acceptance by the Council.

After some discussion as to the bearing of the Attorney-General's opinion on the case, and the reply recently given to Mr. Hardy, Dr. Montgomery said as there was some doubt about the case, and as it was stated that other gentlemen who had served their time in the same establishment had had their certificates accepted, he would propose that Mr. Middleton's certificate be accepted. Mr. Middleton had served his five years in the full expectation that he would be allowed to come in for his examination.

The motion was seconded by Mr. Evans and agreed to.

The Registrar read a letter from Mr. W. C. Spencer, of Cork, inquiring whether a pharmaceutical chemist could start a business in conjunction with a registered

dentist not qualified as a chemist, and place over their door "E. and S., Chemists and Dentists."

It was resolved that the Registrar be instructed to reply to the letter, informing the writer that such a firm, consisting partly of persons not qualified, could not legally compound prescriptions.

Mr. Allen brought up the report of the Committee on the Visitation of Examinations.

The report contained several recommendations with reference to the conduct of the examinations for the licence, which were adopted.

The principal change recommended was the extension of the examination to three days, so as to give each examiner a day to himself.

The reports of the Examiners for the April Examinations were presented.

The following gentlemen passed the examination for the licence in April last:—

William James Baxter .....Coleraine.
Morgan M. J. D'Arcy.....Kingstown.
John Wilson Dickson .....Ballymena.
William Alexander Frizell.....Derry.
William H. Griffin .....Ranelagh.
William James Smyth .....Belfast.

Two were rejected. Out of four who presented themselves for the Preliminary Examination, three passed.

The Council then adjourned.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

Assistants' Association.

A general meeting was held in the Society's rooms, on May 28, for the purpose of terminating the session and arranging business for the ensuing one. The President (Mr. N. S. Smith), in congratulating the members upon their position, spoke of the necessity there had been for such an Association in Sheffield, the satisfactory state it was now in, and the fair prospect it had before it. He said that remembering the ready response which various applications of theirs had received, he looked forward to increased educational facilities for the next session, and felt certain if each member would steadfastly bear in mind the real objects of the Association it would have a long and prosperous career.

The Honorary Secretary, Mr. J. Marshall, read the report, showing the Association to be, in all points, in a healthy and flourishing condition.

The President and Secretary were unanimously re-elected, who, with a Committee, consisting of Messrs. Eberlin, Grierson and Humphrey, will manage the business of the Association in the ensuing session.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

Liquefied Gases.

The last of the Friday evening lectures at this Institution for the session 1884 was delivered on the 13th inst., by Professor Dewar, upon "Liquefied Gases," and proved especially interesting, as during the lecture experiments were made in which the lowest temperature that has probably been obtained in any lecture-room—about −140° C.—was registered. Professor Dewar made an opening statement to the effect that he considered the liquefaction of gases had been one of the most useful aids to the advance of chemistry. He then explained the method by which Faraday effected the liquefaction of gases by heating them in closed tubes, and showed the formation of liquid chlorine by means of a projection upon the screen. He stated, however, that only a few gases could be liquefied by this method, and that the use of liquid carbonic acid as a refrigerating agent had superseded it. He reminded his audience that when this liquid was suddenly released from the pressure under which it had to be kept the fall of temperature consequent upon the vaporization of a portion of it caused the solidification of the remainder, which appeared in the form of a white snow that could be handled with impunity. If this snow were submitted to pressure a solid having the appearance of ice was produced, which unlike the snow sinks in water and emits dense white fumes; these fumes the lecturer showed to be due to the rapid ebullition of the carbonic acid in the water. The lecturer said some difficulty had been experienced in registering the low temperatures now obtainable, as both the air and alcohol thermometers become useless owing to their condition being changed; he therefore used a reflecting galvanometer to register his results. Prof. Dewar then referred to the laws formulated by Boyle, Andrews and others concerning density and pressure, showing that each new law became more complicated because of necessary corrections. This led to an explanation of the term critical point, the critical point of carbonic acid being admirably shown upon the screen by the lecturer, where the moving striæ and sudden change of condition could be distinctly observed. By taking advantage of the phenomenon of heat becoming latent during the vaporization or boiling of liquid carbonic acid a temperature of −80° C. had been obtained, whilst the still lower temperature of −115° C. had been reached by vaporization under a very low pressure. Liquid nitrous oxide had also been used for the same purpose, a temperature of −90° C. being registered, but both these compounds solidify at a lower temperature and are therefore comparatively useless. The Polish chemists, Wroblewski and Olszewski, have obtained the best results, however, by the use of liquid ethylene, a transparent fluid hydrocarbon which is the chief illuminating constituent of coal gas. With the use of ethylene a temperature of −140° C. is registered, which allows of oxygen and nitrogen being solidified, whilst by similarly using the liquid oxygen in further experiments a temperature of less than −200° C. has been obtained and hydrogen converted into a viscous liquid. It is impossible to illustrate these last results in a lecture-room, but Professor Dewar in a series of experiments with liquid ethylene reduced alcohol to a gelatinous condition, in which crystals could be distinguished, whilst bisulphide of carbon was completely solidified. After the lecture he succeeded by careful manipulation of pressure in demonstrating the liquefaction of oxygen, an experiment probably not before shown at a lecture. Though several chemists have stated that they have obtained lower temperatures than those above mentioned, Professor Dewar considered their observations must be wrong, owing to the incorrect marking of their thermometers, as until lately no one had succeeded in solidifying oxygen.

INTERNATIONAL HEALTH EXHIBITION.

Series of Conferences under the Auspices of the Medical Officers of Health, the Sanitary Institute of Great Britain and the Parkes Museum of Hygiene.

At the Conference held on Wednesday, the 11th inst., under the presidency of Mr. Edwin Chadwick, C.B., Dr. J. Sayer Bristowe, F.R.S., read a paper on "Industrial diseases." He said that the investigation of the cause of disease was a subject which had ever engaged and still engaged the choicest intellects in the profession of medicine, for not only did it present the highest scientific fascination, but it was fully recognized that it was in the discovery of the causes of disease that our best hopes of dealing successfully with diseases, either in curing, in mitigating or in preventing them, resided. The special subject he proposed to deal with was diseases due to poisonous or other influences incidental to certain occu-

pations, which could only be escaped, if escaped at all, by the adoption of special precautionary measures. One of the most interesting groups of industrial diseases was that in which injurious effects arose from the slow action of metallic or other inorganic substances, or their derivatives, upon the system. Speaking on chronic lead poisoning, he said this disease was not limited to operatives in lead, such as plumbers, type founders, and manufactures of lead toys, but the general public were by no means free from danger, and that isolated cases, or groups of cases, of plumbism, referable to the drinking of water stored in lead cisterns, to the use of hair washes or cosmetics containing lead, and even to the long continued employment of lead as a medicine, were often brought under the notice of medical men. After referring to the symptoms of chronic lead poisoning, the paper dealt with the subject of chronic copper poisoning, chronic arsenical poisoning, chronic mercurial poisoning, chronic phosphorus poisoning, and the effects of irritants applied to the skin and to the lungs. Apart from the inhalation of solid particles which irritated the lungs into disease, it was certain that many occupations tended to the production of pulmonary phthisis and fatal bronchial affections; and in proportion as the people of a district were attracted to any collective indoor occupation, in such proportion, other things being equal, the district death rate by lung diseases would be increased, for bad ventilation tended to develop among work people a large excess of phthisis. Upon the spread of infectious fevers he thought this might be due in no inconceivable degree to the collection and importation of rags, for the purpose of paper making. In 1865 he made an extensive inquiry into the question of infectious diseases by rags, and more especially among the work-people engaged in paper manufacturing, and the result was to a considerable extent reassuring, for it appeared that no diseases special to foreign countries had ever been introduced amongst them by the agency of foreign rags, and that, as regarded native rags, the only disease that was ever spread by them was small-pox, and this only rarely. The next disease referred to was what is known in Bradford as the "wool-sorter's disease," which had been ascertained to be the anthrax fever or splenic fever of cattle which prevailed in many parts of the Continent, and also in Asia and America, and was known to spread rapidly from cattle to other animals and to man. The chief sufferers by this disease were those who handled the raw hides coming from abroad, namely wharf labourers, sorters' labourers, and tanners' labourers; but no evidence of the occurrence of the disease could be traced among fellmongers. The paper concluded with a reference to the disease known by the name of "clergyman's throat," to which all habitual or professional speakers and singers are liable, and "writer's cramp," to which persons who had acquired skill in the use of particular groups of muscles were liable, such as the pianist, the swordsman, and others.

Dr. Ord, in opening the discussion, referred to overcrowding, working in ill-ventilated and ill-lighted rooms, as a chief cause of industrial diseases.

Dr. Greenhow said the question the Conference had met to discuss was one which had received very little public attention, although it was second to no other sanitary question of the day, because the mortality produced by "industrial diseases" was very large. Operatives in cotton factories, miners, printers of colour, paper stainers and chaff cutters inhaled dust given off in their operations and were very liable to lung diseases. He hoped the effect of the discussion would be to stir up public attention upon the subject.

Dr. Vacher (Birkenhead), after referring to various unhealthy trades, suggested that employers of labour should be compelled to adopt the most approved scientific processes for rendering shops and warehouses healthy, by which means trade diseases would be very much mitigated and the greater part of them entirely repressed. The Alkali Acts had done a great deal to improve the state of health in the neighbourhood of alkali works, but not much towards improving the health of the workers in the various works. He agreed that dust was a source of great evil, millers, bakers, masons and coal whippers suffering therefrom, but this danger could be greatly diminished by proper ventilation; cases of lead poisoning would be less rare if the precautions suggested by Government Blue Books were taken.

Dr. Ogle referred to the enormous difference in the rate of mortality amongst different trades, and cited statistics to show that the largest death rate was amongst innkeepers, brewers, butchers, cabmen, carters, bargemen, hairdressers and others; and the lowest amongst clergymen, gardeners, farmers, agricultural labourers and grocers.

At the Conference held on Thursday, June 12, under the auspices of the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, Dr. Alfred Carpenter in the chair, the subject discussed was the "Spread of Infectious Diseases, first, through the Agency of Milk, and, next, through other Agencies."

Dr. W. N. Thursfield read the first paper, and stated that the subject was one with reference to which it was specially desirable, on the one hand, not to create undue alarm, and, on the other hand, not to make light of or pass over apparent sources of disease, however improbable they might appear at first sight. It was, however, one of growing importance. Milk was becoming daily more recognized as the staple food for children, as from a variety of causes the proportion of women physically incompetent to suckle their offspring was yearly increasing. The use of milk by adults had of late enormously increased, and, although he could not but consider that to drink milk as a beverage with heavy meals was a grave dietetic error, the modern practice of drinking glasses of milk instead of beer at railway refreshment bars and elsewhere was certainly not to be condemned. The greatest risk of danger from milk was in the fact that the chief consumers were of an age when the body was most susceptible of taking disease, and the consumption of unboiled milk might literally be said to bring the consumer into closer connection with the animal from which the milk was drawn, and always to some extent and often most intimately with the family and domestic arrangements of, at least, one householder, and often two. Since Dr. Ballard's report of an epidemic of typhoid fever in Islington in 1870, when attention was called to the matter, records of about a hundred epidemics alleged to be traceable to milk dissemination had been published, and others, not published, had been noted. Making allowance for all doubtful cases it might be accepted as an absolute fact that epidemics of typhoid fever and scarlet fever had been repeatedly disseminated by milk, and there was very strong evidence that diphtheria had been so disseminated. He believed there was very little accurate knowledge as to the mode in which milk became a vehicle for the germs of infectious disease. To effectually prevent milk epidemics precautions were necessary, first, at the house of the consumer, secondly, at the milk shop of the retailer, and, thirdly, at the dairy farm of the wholesale purveyor. Upon the first point he recommended boiling of milk, as it was a well-known fact the consumers of boiled milk had, as a rule, escaped in all milk epidemics. Upon the second point, he suggested that urban sanitary authorities should have the power to stop the sale of milk consigned from any particular farm on the occurrence of any infectious disease, and that it should be incumbent on retailers, when required by the sanitary authorities, to furnish a list of their customers. Upon the third point, he suggested that the premises on which the business of a milk purveyor was carried on should be registered with the local authority, and every registered dairy should be provided with a plentiful supply of good potable water for the use of the dairy and

cows. The dairy used for storing the milk should not be subject to animal effluvia of any kind, and should be satisfactorily drained, and not used for general domestic purposes. Milk should not be transmitted for sale when presenting any marked deviation from ordinary appearances, in either colour, smell, or general condition, or when obtained from an animal manifestly the subject of constitutional disease, acute disease, or infectious disease of any kind. On the occurrence in the person or family of anyone employed about the cows or the dairy, of any eruptive or infectious disease at all, or of any throat complaint affecting three or more persons, the affected individuals should be isolated, and the fact notified to the health officer. He believed inspections might be so carried out that the inspector would come to be looked upon, not as an interloper only borne with so far as the law demanded, but as one in a position, under certain circumstances of disease incidence, to give advice, valuable from a commercial, as well as from a sanitary point of view. Whatever differences of opinion there might be on technical points and matters of detail, he thought that all who had carefully considered the subject would have formed a decided opinion that the adoption of regulations as to the sale of milk should be incumbent on local authorities, and not permissive, as at present, and that the regulations should be applied at the producing as well as the distributing depôts.

Dr. W. H. Corfield next read a paper on "How Infectious Diseases are Spread." He thought the atmosphere was the most universal medium of communication, though some poisons were more readily conveyed in this way than others. Poisons of several diseases might be conveyed by means of clothing, and laundries were often the agencies of dissemination. An instance was given where chicken pox had been communicated by means of letters. Drinking water was a most important vehicle for conveyance of cholera and enteric or typhoid fever with dysentery in hot climates; and diphtheria might be spread in this way. In some instances it had been shown that flies conveyed the poison of infectious deseases.

Professor de Chaumont, F.R.S., thought there could be no doubt that milk was a vehicle of communicating typhoid and enteric disease, and in a smaller degree also scarlet fever and diphtheria, although this view was by no means shared upon the Continent. Before attributing disease to milk the cause should always be thoroughly investigated, because it occasionally happened that it was due to other causes.

Mr. Shirley Murphy said in practice it was impossible to detect these poisons in milk in such a manner as to enable the investigation to be of use in stopping an outbreak. The only way in which it could be known whether milk was infected with the germs of scarlet fever or enteric fever was by the effect it produced on the people who drank it, and it was an unfortunate thing that medical officers of health were unable to prevent infection until a certain number of deaths had occurred. He agreed with the readers of the papers that there was less chance of infection to persons drinking boiled milk.

Dr. Flemming, Dr. George Wilson, Dr. Priestly, Dr. Pringle, Dr. Armstrong, Dr. Charles West, Dr. Anderson, Mr. Burns and Dr. Dudfield having also addressed the meeting,

The Duke of Buckingham (President of the International Health Exhibition) said this question was one in which he took an especial interest, and he hoped the result of these Conferences will be to draw the attention of the public to the subject. One of the most remarkable effects of that Exhibition would, he trusted, be the elucidation of a vast number of sanitary questions which affected the whole of the inhabitants of this country. The question of sanitary legislation was no doubt one which pressed more and more upon the attention of the public, and it came home to the labourer as well as to the rich man. He quite concurred in the view which had been expressed, that a more general control over sanitary matters was wanting in the country as much as in large towns, and Parliament must before long be called upon to deal with this question. The object of those Conferences was to bring forth the evils which now existed, and to elicit opinion as to the general grounds upon which they might be dealt with.

After a few remarks from the Chairman, the Conference adjourned.

At half-past 5 o'clock Miss Smithard gave a lecture on Dairy Management, with a practical demonstration of butter making. She dwelt especially on the necessity for absolute cleanliness in the dairy, and all vessels appertaining to it, and on attention being given to temperature, a slight rise or fall of which would prevent the formation of the butter. The Normandy and Danish systems of butter making were described, and some very nice looking butter was produced at the conclusion of the lecture, and worked up into proper form for market.

Lord Reay, who occupied the chair, in proposing a vote of thanks to Miss Smithard for her admirable lecture, expressed a hope that English farmers would pay more attention to dairy work, as there was no reason why England should not make the best butter in the world, and even export it to foreign countries instead of depending on them for her own supply.

The next Conference of this series was held on Friday, June 13, the Earl Fortescue in the chair. The Chairman said that in the promotion of sanitary reform affecting the widespread work of sanitation, it must be inevitable that individual liberty and the rights of property must to a certain extent be interfered with for the public good. He should listen attentively to the arguments for and against a novel, but by no means unprecedented, extension of that interference in the shape of compulsory notification of the existence of infectious diseases. It was for the advocates of any compulsory interference with individual liberty or with the rights of property to justify exceptional legislation for that purpose.

Dr. Alfred Hill read a paper on "The Notification of Infectious Diseases: its Importance and Difficulties." The paper, after referring to the value of compulsory notifications of births and deaths, dealt with the importance of sanitary authorities having the earliest possible information of disease in order that its spread might be prevented. The objection to voluntary notification was that it was incomplete, and consequently useless for the prevention of epidemics. The value of complete notifications was well seen in Birmingham during the early days of the present visitation of smallpox. After referring to the various objections to the proposal, namely, the compulsory character of the duty, the antagonism between medical practitioners and medical officers of health, the betrayal and destruction of that confidence which was necessary between doctor and patient, and that notification would be injurious to business, the lecturer concluded by expressing his opinion that these objections were for the most part of a hypothetical and speculative character, and that its principal opponents were persons who had no actual experience of its working. On the other hand, both the public and the medical profession in the thirty-eight towns where it had been already submitted to a practical test accepted it with satisfaction.

Dr. Alfred Carpenter also read a paper on the same subject, but dealt more particularly with the right and duty of the State to enforce the notification of infectious diseases. Having detailed the history of the progress which had been already made in the direction of notification of disease, he said the object of notification was not simply a registration, but a repression of disease, and if the repression was brought about the means whereby it was done was of no consequence. He suggested that they should try to get a general Act which should apply the same law as to infectious disease as now applied to contagious diseases among animals. If after a time the

general application of such a law failed in its effect there would then be a sufficient reason for placing penalties upon the whole medical profession for not performing that which could only be regarded in the light of a moral duty. The power of instituting prosecution for not carrying out the law should be entrusted to the Medical Council of Great Britain, so as to get rid of the possibility of professional rivalry and vindictive or malicious action.

Mr. W. Blyth thought those who wished for compulsory notification had to make out a very strong case before it could be obtained. He believed that a case had been made out for some alteration, though he could not go so far as the readers of the papers. Some medical gentlemen imagined that compulsory notification would altogether stamp out infectious disease, but this was a fallacy, as many persons were every day walking about the streets suffering from scarlet fever, who did not even know they were suffering from the disease.

Dr. Carter (Liverpool) did not believe that the private Acts now in force would work without serious modifications, and that they did not control the spread of infectious disease more than it was controlled in other towns without such Acts. In support of this view he quoted statistics to show that in towns where the Act was in force the death rate had not been in the slightest degree reduced.

Dr. Armstrong (Medical Officer of Health of Newcastle-on-Tyne) maintained that since the Act had been in force in Newcastle great improvement in the health of the inhabitants had taken place.

Mr. William Young (Secretary to the Society for the Compulsory Abolition of Vaccination) objected to compulsory notification, and suggested that as zymotic diseases were being stamped out by the present sanitary arrangements they should be tried a little longer before legislation was attempted. He believed the bogie of infection had been raised up to serve some purpose.

Dr. Mahomet thought the system of notification and isolation would not answer; for in the case of measles the most infectious period was during the first four days, when the disease could not be diagnosed. Typhus had been almost banished by improved sanitary arrangements, and with regard to small-pox that could be prevented by vaccination. Isolation might do good in the case of scarlet fever if every case could be dealt with, but many persons had it without knowing it.

Dr. Dudfield spoke in favour of notification of infectious disease, and referred to the good effects of the system as carried out in Kensington.

Mr. James Bailey (Secretary to the Vigilance Association) urged that a good case must be made out before such a measure was attempted to be forced on the poorer classes, for he did not think sanitary officers would attempt to meddle with the rich. He agreed with Dr. Carter that the laws which were in force in certain towns compelling compulsory notification had not resulted in any marked diminution of disease.

Dr. N. Hardy, as a medical man, objected to the principle of compulsory notification, and referred to the great plague of London, when compulsory notification was necessary, as an instance that it would not stamp out disease.

Professor Corfield said it was absurd to say that the notification of epidemic diseases did not prevent the spread of disease. In such cases as measles, schools could be closed directly the disease was known to exist, and only recently this disease was checked in St. George's, Hanover Square, in this way. He objected to the liberty of the subject to spread infectious diseases.

Dr. Charles West testified to the immense advantage of notification, but did not go into the question of compulsion. He had seen the evil arising from concealment in a health resort in the South of France, and the diminution of contagious disease where notification was practised.

Dr. Taaffe (Brighton) said he could have prevented the spread of typhoid fever amongst ninety families, i the first case, which arose from contaminated milk, had been notified to him. He was in favour of compulsion.

The Chairman, in summing up the discussion, said it seemed to him that a case had been made out for compulsory notification of disease, but after the difference of opinion which appeared to exist amongst the medical profession he did not think a case had been made for compelling medical men to notify cases which came under their notice, but that the responsibility should lie on the householder. As an old sanitary reformer he could not conceal from himself that the fullest notification did not always prevent the spread of zymotic disease, whilst in other cases where favourable food conditions and cleanliness prevailed such diseases did not spread.

At the Conference on Saturday, Lieutenant-Colonel Sir J. M'Garel Hogg, Bart., K.C.B., M.P., in the chair, two papers were read: (1) "The Disposal of the Dead," (2) "Cremation." The first paper was read by Mr. A. Wynter Blyth, who said the term "disposal of the dead" in its popular narrow limitation meant simply the disposal of human remains, but, taken in its widest significance, included the disposal of everything which had had life, whether vegetable, animal, or human. He should confine himself to the methods of dealing with human remains, viz., simple exposure, burial in the ground, in the sea, cremation, and embalmment, under which head might be included all kinds and methods of preservation. The first method only existed among a few races and tribes, and as to the second, viz., earth burial, its origin had been confidently ascribed to sanitary precautions, but, so far as he could see, the study of the habits and methods of thought of primitive man by no means countenanced this view. If this plan were to be continued he would suggest that only one body should be buried in a grave at a minimum depth of six feet, that the use of vaults should be abolished, that no irremovable headstones or monuments should be allowed, and at the end of a certain number of years, reversion to agricultural purposes. With regard to burial in the sea he thought the same objection applied to that as to cremetion, that it too effectually disposed of the body, rendering certain crimes difficult of detection. With regard to cremation, he said the practical aspects had recently received a fresh impetus in the form of a declaration by Mr. Justice Stephen to the effect that there was nothing in the English law forbidding cremation, and by a Bill which was introduced into Parliament with the object of enacting regulations so as to insure that the practice of cremation was not applied to the concealment of crime. As to the objection against cremation that the discovery of organic poison in cases where murder had been committed would be impossible, he suggested that anyone desiring the cremation of a friend or relative should give notice to the coroner, who would thereupon direct a medical man to at once visit the case, make a *post-mortem*, and give the coroner a written report, and upon this report, if favourable, the coroner would give his certificate for cremation. The expense of the medical examination would of course fall on the relatives of the deceased. As to embalmment, he thought all persons found dead in the streets, and not identified, should be subjected to this method, and remain unburied for many months in order to give an opportunity of solving the problem of what were called "mysterious disappearances." In conclusion, he suggested that funerals should take place between 4 and 8 a.m., and that unnecessary expense should be dispensed with.

Mr. Wm. Eassie, C.E., next read a paper on "Cremation." He said that upwards of fifty lectures had been publicly delivered upon cremation since the foundation of the Cremation Society of England in 1874, and the general consensus of opinion was in favour of the introduction of the practice. With regard to the only

tangible objection made to cremation, that it might serve as a screen for poisoners, he thought the conditions enforced by the Cremation Society before allowing the use of their Crematorium at Woking would fully meet the case. The following were the conditions:—"(1). An application in writing must be made by the friends or executors of the deceased—unless it has been made by the deceased person himself during life—stating that it was the wish of the deceased to be cremated after death. (2). A certificate must be sent in by one qualified medical man at least, who attended the deceased until the time of death, unhesitatingly stating that the cause of death was natural, and what that cause was. (3). If no medical man attended during illness, an autopsy must be made by a medical officer appointed by the society, or no cremation can take place." Crematories were now in full use in Gotha, Milan, Rome and other places, and during the last few years some five hundred bodies had thus been withheld from lingering corruption. Cremation societies, with thousands of adherents, existed in France, Holland, Sweden, Spain and Portugal, and the adoption was merely a matter of time in America. Cremation could be performed within two hours at the expense of a few shillings, and an ordinary body reduced to some three pounds weight of pure white ashes. The crematory chosen by the English society was built upon the Gorini pattern, a plan of which was exhibited, one of its chief advantages being that the commonest fuel could be made use of. On one occasion he destroyed 120 lbs. weight of a carcase at Woking, chiefly with a few faggots of wood, at a cost of 3½*d*. each. After referring at some length to the dangers attendant upon burial, and the advantages of cremation, especially in cases of persons who had perished from disease, the paper concluded, with the expression of a hope that some State regulations would soon be formulated, such as were contained in Dr. Cameron's Bill, and such as had been published by the Cremation Society of England.

Dr. Cameron, M.P., thought this subject was one of the most important that could well be discussed in connection with a Health Exhibition. From a report published in 1851, it appeared that in England and Wales as many persons died and were buried without any certificates as to death being given, as died in the metropolitan district in the course of three months, and in England, Scotland and Ireland the number of persons who were buried without a certificate in a year amounted to as many as died in the entire metropolis in five months. With regard to cremation, he thought it was very hard that if a person wished to be cremated he should not be allowed to have his wish, though he did not believe that cremation would become general for some time yet. If cremation was legal Government had no right to interfere in the matter. As to the objection that it would shield crime, he thought that was disposed of by the statement he had already made as to the numbers who went to their graves without any certificate of death.

Sir Spencer Wells, Bart., was of opinion that the present style of burying the dead perpetuated disease, and that cremation would be a great boon. He was glad to see that this question had been taken up by the Commissioners of Sewers, and no doubt cremation would soon be adopted.

Dr. Farquharson, M.P., referring to the discussion which had taken place in Parliament upon the subject, said the supporters of cremation had been twitted by Sir W. Harcourt that they had not the public at their back. Having said that, Sir William thought he had crushed the movement; but he must have been surprised to find that seventy voted in favour of the Bill, and that the Press almost unanimously supported the movement. The growth of opinion upon the subject was very rapid and as it had been held that cremation was legal. No doubt when the subject again came before Parliament it would meet with more success.

Rev. Brooke Lambert strongly advocated cremation and denied that it was contrary to religion. If it were supposed that the actual carcase of an individual comprised the title deeds to resurrection, then they came to this extraordinary conclusion, that the martyrs, who of all men in the world were supposed to have the best right to resurrection, were the very people who had lost their title deeds. Those who objected to cremation on religious grounds were the people who had least considered the subject.

Dr. Bartlett also supported cremation, dwelling chiefly upon the chemical aspects of the question.

After a few remarks from Dr. Pringle,

Captain Douglas Galton said, no doubt cremation had many advantages, but it would be a very long time before it became universal in England, and, therefore, sanitarians would do well to pay some attention to other modes of disposing of the dead.

Dr. Dudfield was glad to find the religious and sensational objections to cremation were so far on the decline that there was a chance of the question being discussed and settled upon its merits in the not far distant future. He recommended the erection of public mortuaries and the compulsory removal of dead bodies thereto, more especially from poor and crowded neighbourhoods, as there was no doubt that infectious diseases were often spread by dead bodies.

Dr. A. Carpenter, while not being prepared to go the length of saying the time had arrived for cremating all bodies, thought persons who had died of infectious diseases ought to be cremated.

Mr. Liggins strongly objected to cremation and urged that millions outside that Conference looked with horror upon such a radical change in the disposal of the dead.

Dr. Gibbons also spoke against cremation, and after a few words from Mr. Hodgson and Mr. Smith,

The Chairman said he entirely agreed with the suggestion as to the desirability of having public mortuaries and that in large blocks of artizans' dwellings a place should be provided for the dead.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, June 12, Mr. T. S. Dymond, Vice-President in the chair.

A paper was read by the Honorary Secretary (Mr. Wyndham Dunstan) on "A Process for the Separation of Chlorides, Bromides and Iodides."

The paper was followed by a discussion in which the Chairman, Messrs Blain, Cripps, Elliott, Lowe and Steward took part.

The thanks of the meeting were voted to Mr. Dunstan.

The Reporter on Practical Pharmacy, Mr. R. A. Cripps, then read a Report on "Concentrated Infusions and Decoctions."

The Report gave rise to a discussion in which the Chairman, Secretary, Messrs. Elliott, Job and Short joined.

After some miscellaneous business had been transacted, the meeting adjourned.

Parliamentary and Law Proceedings.

Prosecution under the Pharmacy Act.

In the Second Court at the Sheffield Town Hall, on Wednesday, June 11, before Mr. T. Turner and Mr. H. J. Wilson, Thomas Wilcock, provision dealer, of 81, South Street, Park, was summoned for that he, "on the 9th February did unlawfully sell by retail to one Ann Castle, certain poison, to wit, opium, being poison within the meaning of the Pharmacy Act, 1868, which poison, when sold, was contained in a bottle, and which bottle was not distinctly labelled with the name of the article and the word 'poison,' and without the name and address of you,

the seller of such poison, contrary to the form of the statute."

Mr. Flux, of the firm of Messrs. Flux, Son, and Co., London, solicitors to the Pharmaceutical Society, appeared on behalf of the prosecution, and Mr. S. B. Auty defended.

Several Sheffield chemists were in court during the proceedings, and the case was watched with much interest.

In opening the case, Mr. Flux said he would do so as shortly as possible and would not say one word to create prejudice. But he should ask to be allowed, at another stage of the proceedings, to make a few statements on public grounds. The prosecution was under clause 17 of the Pharmacy Act, 1868, which declared "it should be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article, and the word 'poison,' and with the name and address of the seller of the poison," and also that "any person selling poison otherwise than as herein provided shall, on summary conviction before two justices of the peace in England, be liable to a penalty not exceeding £5 for the first offence." The charge against the accused was that he sold poison in a bottle without labelling it; amongst the contents of the bottle was opium, or a preparation of opium within the meaning of the schedule, The sale was made to a Mrs. Castle, who had applied to the defendant for some "infant's mixture." A portion of the contents of the bottle was administered to an infant child by the mother; the infant died, and an inquest followed.

Mr. Turner: Is it necessary to bring this in?

Mr. Flux: Yes; because I am going to bring in evidence the depositions of the accused at the inquiry.

Mr. Dossey Wightman, Coroner, was then called and examined by Mr. Flux. He produced the depositions of the defendant, who gave evidence at the inquest on the 19th February on the body of Frederick Castle. He stated, amongst other things, that he had known the parents of the deceased about three years. He remembered the mother calling upon him, and saying she had a child which was poorly. She had with her a child, between two and three years of age, with its throat tied up, and she said that was also poorly. She asked for some mixture—he believed she specified it "infant's mixture"—and said she wanted it for the child who was with her. He replied that he had a mixture which he thought would do the child good. The woman purchased a quarter of an ounce. He read the dose to her from the label on the bottle which he had, and told her about ten drops would be the proper proportion to administer to the child. He did not put a label on the bottle which he gave the woman. He did not know the mixture contained any preparation of opium. The label on the bottle in his possession did not say "poison." He was not told the age of the child, but judged from its appearance.

Cross-examined by Mr. Turner: I understand you to say that the child which died was not the baby for whom this stuff was sold.

Mr. Wightman: The woman, according to her evidence, applied for the medicine, with a child with her, but this was not the child on which the inquest was held. The inquiry was concerning the baby, which was at home with her husband.

Mr. Turner: Not the child taken to the shop?

Mr. Wightman: No; and for aught I know that child is living now.

Mrs. Sarah Castle, the wife of William Castle, cutler, living in Leader Road, Hillsbro', examined by Mr. Flux, spoke to the purchasing the mixture from the defendant. She asked him if he had any stuff to soothe a baby, saying that she found the druggists' shops were closed. That was on a Saturday. She did not know the day of the month. The child died six days afterwards. The defendant told her he had some "infant's mixture," saying it had done many children good; it would, he said, soothe them. She wanted it for both children, but more so for the babe. She fetched a bottle and purchased a pennyworth of the mixture. She was told to give the babe ten drops and the other child half a teaspoonful, which she did as soon as she got home. The bottle was not labelled.

Cross-examined: I am twenty-two, and have been married about three years. A neighbour suggested that I should get some soothing syrup, and I was told to go to a druggist, but they were all shut up. When I went to the defendant, I asked for some "infant's mixture," telling him what it was for. I did not lead him to understand that I wanted the mixture for the girl that was with me. I said distinctly that I required it for the babe, and I gave it ten drops, as desired, when I got home, in some warm water and with some sugar. On the following Monday I again gave the babe some mixture. It did not seem to take any effect upon the child.

Mr. Turner: We do not seem to get any nearer to the point.

Mr. Wilson: Do you suggest that the man intended to poison the child? The questions would be more to the point if you would show that there was not opium in the bottle, or that it was labelled.

Mr. Auty: I think I have a right to put these questions. I want to get from the mother the effect the mixture had upon the child. If she found that it had a pernicious effect upon the child she should have stopped administering it.

Mr. Turner: But that would not affect the question whether there was poison in it.

William Castle, the father of the deceased child, examined, spoke to handing the bottle which had contained the mixture to the police. He found it in the cupboard. There was no label upon it. There were a few drops in it when he handed it to the police.

Cross-examined: I am twenty-seven years of age. I know nothing about my wife going for the mixture, but I asked her to get something for the baby, and I saw her give it the drops.

Police-constable Thornton, examined, stated that he received the bottle from the last witness on the 19th February. It then contained some ten or twelve drops. He handed the bottle to Mr. Allen, the Borough analyst. Witness also saw the larger bottle. Both were produced at the inquest.

Mr. Alfred Henry Allen, Borough Analyst, deposed that he was examined at the adjourned inquest. Previous to that he had analysed the contents of the large bottle produced. There were about five drops of the mixture in the lesser bottle, and the chief constituents were the same as in the large one, so the presumption was that the liquids were identical. The chief constituents were rhubarb, magnesia, spirit, some aromatic waters, and laudanum, or a preparation of opium. Whether introduced in the form of opium or not he could not say. Neither could he say whether it was introduced in the form of a tincture called laudanum.

Cross-examined: I am not certain that the small bottle contained opium. The quantity was too small for me to to be able to ascertain. I can swear that the large bottle contained opium.

Mr. Flux intimated that this was the conclusion of his case.

Mr. Auty asked whether he had a case to answer. Personally he thought there was nothing to answer. If their worships said there had been sufficient evidence given for the case to be proceeded with, he would say something in mitigation of the penalty.

Mr. Turner: We should like you to proceed.

Mr. Auty then called,

Henry Linley, Oakhill Road, Nether Edge, who said he formerly carried on the business of a chemist and druggist on Sheffield Moor. He was not a member of the Pharmaceutical Society or a Pharmaceutical Chemist. When in business he made up a mixture, and recognized the label on

the larger bottle produced as similar to those he used for distinguishing the preparation. He made up two similar mixtures. One, which contained a small portion of laudanum, he sold to his retail customers; and the other, which contained no laudanum, he kept for wholesale purposes. He could not say whether the mixture in the larger bottle contained laudanum or not, seeing that it was between four and five years since it was sold. He should not sell the mixture containing laudanum to wholesale customers. It was not necessary to label a preparation "poison" if it contained only a small proportion of laudanum; but if the mixture went as a preparation of opium then it would be necessary to label it so.

Mr. Flux: You will not say that five years have not passed since the larger bottle left your hands?—No.

Nor that the defendant has not again and again had it refilled at the grocer's?—No.

Mr. Wilson asked Mr. Wightman whether the defendant positively admitted or swore at the inquest that the woman's bottle was filled with stuff from the larger bottle produced.

Mr. Wightman replied that that was his impression at the time. The larger bottle was produced by the defendant, and he admitted that the stuff in the lesser bottle was the same, but he did not remember whether the man said it was filled out of the larger bottle into the smaller one.

After a short consultation the magistrates fined the defendant 20*s.* and the costs, in all £3 1*s.*

Mr. Flux, addressing the Bench, said, Now that the case has been disposed of, I ask permission to mention that the Pharmaceutical Society of Great Britain have instructed me to conduct the prosecution. The 15th Section of the Pharmacy Act imposes on the Society duties in regard to offences under that section, but there is nowhere imposed on the Society the duty of prosecuting in cases of this kind. The Society has received information, on which reliance can be placed, that sales of poisons not labelled as contemplated by law for the protection of the public are made in this town, to a serious extent, by unqualified persons, and having that information the Society has, for the purpose of directing local attention to the state of things and especially to the law on the subject, charged me with the conduct of this prosecution. It will be seen on examination of Section 17 that any person may be prosecutor where an offence such as this has been committed, and I venture respectfully to suggest to your worships, sitting as magistrates of this town, that it may be for the public welfare that the attention of those who in this town are charged with the administration of the law shall be especially directed to the offences against the provisions of the 17th Section with a view to such prosecutions by the local authorities as will secure that the breaches of the law shall be discontinued.

Mr. Wilson: Mr. Flux, I entirely agree [with every word you have said.

Reviews.

GRUNDRISS DER PHARMACOGKNOSIE. Von F. A. FLÜCKIGER.*

The object of this little work appears to be to meet the need of medical and pharmaceutical students for such an elementary book on materia medica and pharmacognosy as shall contain all the useful information which it is imperative for them to know and remember, but shall exclude such matter as is only valuable for reference. It is of course intended for those to whom the German Pharmacopœia is the standard text-book, and consequently a number of drugs not commonly met with in English pharmacies are described in its pages. Besides those occurring in the German but not in the British Pharmacopœia a number of drugs which are of recent introduction, such as cola nuts, coca, curare, gelsemium, quebracho, etc., receive a full share of attention. The classification adopted in the 'Grundriss' differs from that of the larger work by the same author, 'Pharmakognosie der Pflanzenreiches,' in the drugs being arranged not according to their nature, but according to the natural orders to which they respectively belong. The awkwardness of finding the root of aconite, for instance, in one part of the same volume and the leaf in another part is thus avoided. In the present volume the cryptogams are placed first, then follow the phanerogams, and lastly the products derived from the animal kingdom. The classification of the phanerogams is not that followed in Great Britain, the dicotyledons being divided into *Choripetalæ*, including all which are either without petals or have them distinct, and *Sympetalæ*, comprising all which, in this country, are comprised under *Corollifloræ*. Thus *Myristicaceæ* and *Lauraceæ* come near *Magnoliaceæ*, and *Euphorbiaceæ* is placed between *Rhamnaceæ* and *Umbelliferæ*, an arrangement which would prove somewhat puzzling to many English readers, but which nevertheless presents some advantages from the point of view of materia medica, as well as from a botanical standpoint. The natural system is not, however, carried out with regard to the animal products; these being few in number are arranged alphabetically.

As an introduction to more extensive treatises on materia medica, this little volume will doubtless be most welcome to students and will serve to give a good foundation in the subject. If the author has devoted space to the history of the drugs which would perhaps have been better devoted to adding matter of more practical use in everyday life, it must be remembered that, the German tendency to prolixity being taken into consideration, the book is a marvel of conciseness and useful information of the kind that the student requires in commencing the study of materia medica.

In the majority of cases the information has been brought up to the latest date, but the notices of substitutions or falsifications of drugs are less full than might have been expected in a work of this kind. Thus we find no notice of Japanese aconite root, nor the means of detecting the various adulterations of saffron and belladonna root and digitalis, nor of the commercial varieties of jaborandi and jalap, ergot and cantharides, etc. Nevertheless, the book contains a large amount of information clearly and concisely put, and will probably give great satisfaction to the class of readers for whom it is intended.

In a few points, perhaps, one may venture to differ from the learned author, and if these are indicated here it is only with a view that the reader may recognize that there is a difference of opinion on these points. *Laminaria Cloustoni* is described (on p. 1) as a peculiar form of *L. digitata*, Lamoroux. On reference to the author's larger works, however, it will be seen that a better way of stating the facts of the case would be to say that it is a distinct species, formerly included erroneously under *L. digitata*, Lam. Dammar resin presents all the characters of a dipterocarpous product, although it is true that it is usually attributed to coniferous trees. The Arabian aloes possesses different chemical characters from that of Socotra and can scarcely be the product of *A. Perryi*, as suggested by the author.

* Berlin: R. Gaertner. 1884. Crown 8vo. Pp. i.-xxiv. 1-260.

WATER AND WATER-SUPPLIES, AND UNFERMENTED BEVERAGES. By JOHN ATTFIELD, Ph.D., F.R.S.*

Included in a series published under the auspices of the Executive Council of the International Health Exhibition is a volume by Professor Attfield, treating of water and water-supplies and unfermented beverages.

The work is intended to furnish those whose interest in such beverages is more than superficial with information

* London: W. Clowes and Sons. 1884. International Health Exhibition Handbook. Demy 8vo. Pp. i.-x., 1-114. 1*s.*

which is to them not generally easy of access, or is unintelligible when obtained. We congratulate the author on the simple and lucid manner in which he has placed before the unscientific reader the leading chemical and physical properties of water and scientific explanations of certain phenomena connected therewith.

Most interest will, perhaps, be taken in the chapters on the natural water supplies, dealing with the source, the methods of preventing contamination and the means of purifying water from suspended and other impurities: these are very complete. Mineral and aërated waters are described in Section II. But the fourth section of the work, treating of teas of various kinds, coffee, cocoa, chocolate and milk is certainly no less worthy of attention, although it occupies less than one-third of the whole work. We recommend the chapter on tea to the perusal of the fairer sex, who might refresh many hard-workers with a cup of that beverage in which the aroma was more and the tannin less perceptible than is now usually the case. The low price at which the book is published places it within the reach of all who are interested, and will, we think, ensure it the reception it deserves.

Correspondence.

Ethics and £ s. d.

Sir,—When "Ethics" get mixed up with prices they need cautious handling. Criticisms of our neighbour's system of business are more apt to exhibit our own jealousy than a desire for his reformation. They too often overlook the fact that the public good is the true *summum bonum*, and—other things being equal—that "cheapness" is a quality much desired by the public. Pharmacists are no exception to the economical doctrine that he who gives a certain service for 1*s.* is a more profitable public servant than he who gives the same service for 1*s.* 6*d.*; and pharmacy offers no exception to the rule that no good thing can be, in common phraseology, cheap. The public apply both dogmas with tolerable discrimination, and they have been shrewd enough to discover in the matter of medicine that the best is generally the cheapest; accordingly we see that the most successful dispensing businesses are conducted on the 1*s.* 6*d.* system, not upon the 1*s.* system.

The much attacked custom of dispensing by doctors has its origin and its justification in the same principle of public accommodation. The majority of patients cannot afford to pay guinea fees, and the majority of doctors are obliged to meet their medical necessities on other terms. No one imagines that if doctors had their choice they would elect to do double duty for small remuneration, instead of confining themselves to a purely consulting practice acknowledged (not paid for!) by handsome fees; and probably no patient supposes he is equally well served for the smaller cost. These arrangements need no justification; the only wonder is that anybody should think them fit objects for animadversion. When a pharmacist, suffering it may be from a painful insufficiency of that kind of business for which he has qualified himself at much pains and expense, finds fault with medical men for dispensing their own prescriptions he puts himself in a false position analogous to that taken by the latter when they rail at "counter prescribing" as the cause of their lack of fees. Each usage is a necessary concession to a legitimate public want.

Dispensing by medical men has, however, other phases than the typical one referred to in the above lines. Often the doctor enters into an unrecognized partnership with a pharmacist, which is always more or less objectionable. Whenever this happens there must be a pharmacist at least as much to blame as the doctor, and there is no case for accusation on the side of the one vocation against the other. It would be harsh to say that such Kilmainham understandings are immoral, for no doubt many honourable men have been parties to them; but they certainly operate unfairly, and, I think, they are disloyal. They are unfair as interfering with free competition, diverting customers, often against their will,—*experto crede*,—to the doctor's colleague, and because they make unfair distinctions in favour of the doctor's patients as against other customers. The former, in effect, receive a rebate on their medicines as a contribution to the costs of medical attendance. They are disloyal because they tend to perpetuate a system which is injurious to pharmacy.

But what shall be said for the latest development of the pharmaco-medical combination,—one which, I am told, prevails extensively in the suburbs of London? I have it on good authority that it is a practice with certain medical men, who profess to advise patients gratuitously, to inscribe on the prescriptions given in such cases the words "Acct. 2*s.* 6*d.*" (the amount being varied at discretion). This means that the pharmacist to whom the prescription is taken is to charge the patient 2*s.* 6*d.* (the ordinary price being, say, 1*s.* 6*d.*) and he is to credit the difference to the benevolent doctor who gives advice gratis to the poor!

I make no comment. If the naked deformity of the transaction does not ensure reprobation, neither would the strictures of

Outis.

Oil of Limes.

Sir,—Since the appearance of my remarks on Trinidad Oil of Limes in this Journal (p. 1005), I have received a letter from the Montserrat Co., Limited, in which I am informed that the statement therein quoted by me from Mr. Prestoe's letter, to the effect that "the plan is adopted in Dominica and Montserrat of crushing the limes, and then, on the attainment of a large quantity of pulp, proceeding to boil down, or distil," is quite incorrect, at all events as respects Montserrat. The writer adds the following remarks:—"We feel sure that Mr. Prestoe made this statement in ignorance, and would be the first to wish to correct it. The whole of the Montserrat lime essence is made upon our estates, which probably turn out three times as much as all the rest of the West Indies put together. All that we manufacture at present is hand made, neither submitted to boiling or distillation, and the quality is universally admitted to be the finest in the market." I have not had the opportunity of examining a sample of the oil of limes prepared by the Montserrat Co., but of all the samples met with in commerce that I have examined, not one would bear comparison in odour with the specimen of Trinidad oil of limes of which I wrote. In fact I am told that the latter was not recognized as oil of limes by the usual buyers of the article, which is sufficient evidence for my statement that it differs from the ordinary oil of limes.

The Montserrat Company's letter indicates, however, that the difference I have observed is not due to the reason assigned by Mr. Prestoe, and that there must be some other cause for it. I should be the last to wish to publish incorrect statements, or to injure the reputation of any genuine commercial product, and should be glad, therefore, if you will afford me the opportunity of publishing the above statement. If the product of the Montserrat Company has the same fragrance as the Trinidad specimen that I examined, there can be no reason why it should not still be considered the finest in the market.

E. M. Holmes.

Erratum.—In the report of Mr. R. Reynolds's remarks (p. 1016, col. ii., line 4), *for* "those who had *no* great reason to complain of the condition of pharmacy," *read* "those who had *so* great reason," etc.

T. J. Wilkes.—(1) *Viburnum Opulus.* (2) *Stellaria Holostea.* (3) *Corydalis claviculata.*

J. Hutchinson.—(1) *Carex riparia.* (2) *Lolium perenne.* (3) *Bromus sterilis.* (4) *Hordeum pratense.* (5) *Serrafalcus mollis.* (6) *Festuca ovina.*

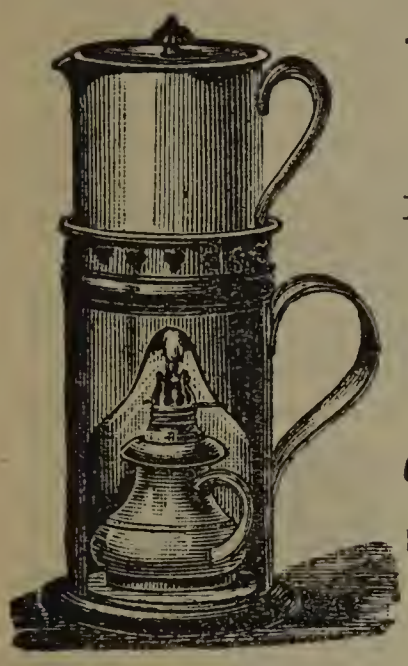
"*Pertinctus.*"—Tinctura ferri pomata is an official preparation in the Pharmacopœa Germanica. It is made by dissolving one part of the official extractum ferri pomatum in nine parts of cinnamon water. The extract appears to be essentially a crude malate of iron made by digesting finely divided iron in apple juice at the heat of a water-bath until there is no further evolution of gas.

H. Brooks.—It is not advisable to accept as true all the statements made by customers with respect to the prices charged at other shops.

Communications. Letters, etc., have been received from Messrs. Ward, Ashwell, Humphrey, Botterill, Merck, Amo, H.

BOURNE, JOHNSON & LATIMER

Direct Special Attention to a few of their most saleable Goods for the present Season. Chemists who wish to increase their returns, who have not seen these Goods, are invited to make up a small sample order, as they are "having a run."



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These only need an introduction to secure a permanent sale.

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„ 17	„ Screw Glass Stopper, White Flint, Black Fittings	„	8/–
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All the above Goods bear a very good profit, and are specially recommended as being very saleable.

10 PER CENT. FOR CASH.

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Certain Sudden **DEATH**

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FIR TREE OIL

INSECTICIDE (Soluble in Water).

For destroying ALL INSECTS and PARASITES that infest Trees and Plants, whether at the Roots or on the Foliage. It cures Mildew and Blight on Fruit or Foliage, and a weak solution Kills all Vegetable Grubs, Turnip Fly, &c. Clears Grapes from Mildew or Mealy Bug without affecting the bloom. Thickened with a little clay, makes a good winter dressing. Destroys Lice and Fleas on Animals and Birds. Sold by Seedsmen and Chemists, 1s. 6d., 2s. 6d., and 4s. 6d. a bottle; per post 3d. extra. Per gallon 12s. 6d., or less in larger quantities.

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Of Bugs, Fleas, Lice, Flies, Gnats, Cockroaches, Mites, Ants, Caterpillars, Weevils, &c.

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Those for Businesses, Assistants, Engagements, &c., will be found on page XVIII.

FOR CHEMISTS.

THE CELEBRATED LONDON TEAS

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"*I CERTIFY, after examination of the Books of the GREAT TOWER ST. TEA COMPANY, LIMITED, that during the Year* 1883 *the SALES of their undernoted STANDARD Teas exceeded those of the Year* 1882, *in each case by the percentage thereon named below.*

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Is soluble in COLD Water, and should be used in preference to any other dip.

FOR TICKS, FLY, SCAB, AND FOR ALL OTHER SHEEP DIPPING PURPOSES.

This Dip has been in use for 40 years, and has never been equalled; it is of uniform strength, does not stain the wool, is suitable for all climates, and equally good as a Summer or Winter Dip. It is especially recommended for Dipping Lambs, and as a certain Cure for Scab.

It supersedes all Carbolic and other Liquid Dips, being so much more reliable and lasting in its effects.

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AS ASSISTANT, or to take charge of a Branch. Ætat. 25. Height 5ft. 9in. Married. Had good experience. Permanency preferred. W. H., 137, Oxford Rd., Burnley.

LOCUM TENENS or TEMPORARY. Disengaged until July 9th. Good references. G. P. HAROLD, Battle, Sussex.

AS ASSISTANT or MANAGER. Varied experience. Good references. Age 28. Minor qualification. Out-door. CHEMICUS, 43, Victoria Rd., Fulwood, Preston.

IN a good class business, by advertiser, who is just out of his time and can be well recommended by his present employer. W. E. SMITH, Lostock Hall, Preston.

BY a qualified gentleman in an Anglo-French Pharmacy. Speaks French and Dutch languages fluently, also English. Age 26. Height 5ft. 8in. Mr. DE LEEMANS, 33, Huntley St., Tottenham Court Rd., London, W.C.

AS ASSISTANT or MANAGER, in London. Qualified. Single. Age 28. W. F., 33, Beak St., W.

OUT-DOOR ASSISTANT, in City or West-end. Passed Minor. Satisfactory London reference. Advertiser, seeking more experience, would accept small salary. Age 25. M. P. S., 17, Bloomsbury Sq.

SEASIDE.—As ASSISTANT for a few months in a high class business. Good experience. Age 27. Major qualification. Disengaged early in July. G. H., 17, The Pavement, Clapham, S.W.

OUT-DOOR ASSISTANT. Age 28 years. Town or country. ALPHA, 144, Stockwell Rd., Brixton, S.W.

ENGAGEMENTS WANTED.

ADVERTISER, qualified, first-class town and country references, 28 years of age, requires re-engagemen as MANAGER or SENIOR. PHARMACIST, 39, New Bridge St., London, E.C.

AS DISPENSER to Surgeon or ASSISTANT to Chemist.—Age 20. 6 years' experience. Seeking permanency. Churchman. ALPHA, 35, Penarth Ter., Penarth Rd., Cardiff.

LOCUM TENENS or ASSISTANT in emergency. By an Associate of long experience and good address. Moderate terms and excellent references. Disengaged. W. C. TAYLOR, 70, St. Stephen's Avenue, Shepherd's Bush.

MANAGER of Branch. Experienced Dispenser, Dentist and Prescriber, good Counterman. Abstainer. Ætat. 30. Height 5ft. 10in. Highest references. ASSOCIATE, 31, Chapel St., Edgware Rd., W.

ASSISTANTS WANTED.

A JUNIOR ASSISTANT, for the Counter, West-end. Out-door. Hours 9 to 7. Apply, by letter only, stating salary required and other particulars, to CHEMIST, 9, Mildmay Park, N.

IMMEDIATELY.—A MANAGER, in-door, for a Branch in the N.W. district. Must be competent, qualified, single, and character to bear strictest investigation. Apply, stating full particulars, to L., care of Messrs. Hodgkinson & Co., 198, Upper Whitecross St., E.C.

AT once.—A good JUNIOR, would be required until end of August. London reference and Minor (at least) preferred. R. HUMPHREYS, 12a, Upper Belsize Ter., N.W., near Swiss Cottage Railway Station.

TO Parents and Guardians.—An old-established firm of Pharmaceutical Chemists, in the West-end, are prepared to receive a well educated gentlemanly youth as APPRENTICE. Moderate premium required. Address, S., care of R. Bremridge, Esq., 17, Bloomsbury Sq., W.C.

APPRENTICE.—WRIGHT & BARNABY, Pharmaceutical Chemists, 223, Oxford St. (near Owens College), Manchester, have a vacancy for a well educated youth, about 17 years of age, who has passed the Preliminary examination.

ASSISTANT.—A thoroughly competent ASSISTANT. Must be a quick and accurate Dispenser. About 22. Minor qualification preferred. Apply to W. THOMAS, 103, Talbot Rd., Bayswater, W.

JUNIOR ASSISTANT (out-door), the end of July, for the season, to assist under manager at Branch Pharmacy. Must be accustomed to Dispensing and first-class business and possess undeniable testimonials. Address, with full particulars, and carte, to R. HAYTON DAVIS, Pharmacist, High and Central Harrogate.

AN ASSISTANT (in-doors), for a Prescribing and Dispensing business. Apply, W. C., 19, Eccleston St., S.W.

AS JUNIOR, indoors, in Wholesale, Retail and Dispensing. Age about 22. Hours 8 to 8 and 9 alternately, little Sunday duty. Send age, height, references, salary required, and photo. (which will be returned) to T. BAILEY, Chemist, Coventry.

AN ASSISTANT (in-door). Gentlemanly appearance and address, obliging manners, steady. Unexceptional references required from last situation. Good Prescriber and accurate Dispenser. Age 24 to 30. State qualifications. Address J. L. MCMILLAN, 21, Formosa St., Maida Hill, Paddington.

AT once. An ASSISTANT, age about 21. Churchman and abstainer preferred. Please state full particulars and salary (in-door) required, to W. ADAMS, 141, Exeter St., Plymouth.

ASSISTANTS WANTED.

A QUALIFIED Assistant, about 22 years old. Apply, with full particulars, to Glaisyer & Kemp, Brighton.

AN Assistant, about 22. If applying by letter, state age, height, salary expected, &c., and enclose photo. (to be returned), to J. W. Taplin, 13, Desboro' Pl., Harrow Rd., London, W.

A QUALIFIED Assistant, to Dispense for a Surgeon, and assist in a mixed country business. W. K. Cooke, Pharmaceutical Chemist, Diss.

GOOD Assistant, wanted for Demerara. Must be honest, strictly sober, industrious, and thoroughly understand Dispensing, &c. Those who can Extract Teeth will be preferred. Full particulars on application. When writing, state age, height, and qualification. K., Davy, Yates & Routledge, 64, Park St., S.E.

A QUALIFIED Assistant, out-door, about 22 years of age, accustomed to Dispensing and a good country business. Apply, with references, to H. W. Allen & Neale, King's Lynn.

JUNIOR Assistant, in good class light Dispensing and Retail. Must be steady, reliable Dispenser and good Salesman. Apply, stating salary required and other usual particulars, to W. C. Fry, Taunton, Somerset.

IMMEDIATELY.—In a light Retail and Dispensing business an Assistant. One only employed. About 23 years of age. Minor qualification. Of gentlemanly address. Fully experienced in Dispensing, and able to take charge in absence of principal. One desiring a permanency preferred. Address, with usual particulars, stating salary required, C. B. Miller, Dispensing Chemist, Blackheath, S.E.

WHOLESALE.—Experienced Dryman. Address, stating age, experience and salary required, to Dryman, care of Lee & Nightingale, Advertising Agents, Liverpool.

MR. STAMP, Hampstead, N.W., requires at once a competent man as Dispenser. Must be accurate, quick and neat in his work and have had experience in a Pharmacy doing first-class business. A gentleman desiring a permanency will find a comfortable home. Apply personally, or by letter, enclosing photo., stating salary required and all particulars of previous engagements, &c.

IMMEDIATELY.—A competent Assistant, about 23 years of age, who has been accustomed to a good Dispensing business. One only kept. Apply, stating age, salary, references, &c., to R. S. Dampney, 87, Abingdon Rd., Kensington, W.

JUNIOR or Improver for a Mixed country businesss. Must speak Welsh. Assistance would be given to one preparing for examinations. Rouw, Pharm. Chemist, Ruthin, N. Wales.

A MANAGER, in-door, suburbs of Birmingham. Must be competent, qualified, single, and character to bear strictest investigation. Apply, stating full particulars to M. A. Gould, Chemist, Harborne, near Birmingham.

IMMEDIATELY.—Competent Assistant. About 24 or 25. Also Junior. Personal application preferred. Windle, 452, Edgware Rd., W.

A COMPETENT Assistant, age about 24, for a first-class Retail and Dispensing business. Apply, stating age, height, references and salary required, also carte (to be returned), to Pharmacist, 13, Whitefriargate, Hull.

SEA-SIDE.—A qualified gentleman to take the entire Management of a light Retail and Prescribing business for a widow. Duties light. In-doors. Comfortable home insured. State age, salary required and enclose photo. with references, to Alpha, care of Messrs. Meggeson & Co., 14, Miles Lane, Upper Thames St., London.

ASSISTANTS WANTED.

A COMPETENT Assistant, not under 23 years of age, of good address and experience. Must have good references as to character and ability. Apply, personally if possible, to Mr. Bower, Pharmaceutical Chemist, 96, Tottenham Court Rd., London, W.

SENIOR Assistant, in a good class of business. Unexceptionable references required, as the proprietor does not reside on the business premises. A Junior Assistant kept. Apply, stating age, height, previous experience, to Delta, care of Evans, Gadd & Co., Exeter.

IMMEDIATELY.—An Assistant or good Junior (out-door). Apply, sending carte and references, to R. Ryott, Newbury. Salary £70 to £78 per annum.

EARLY in July, in-doors, an Assistant from 20 to 25 years of age, accustomed to a Mixed light Retail country trade with Dispensing. Must be steady and general satisfactory references absolutely necessary. No Sunday duty. Please state usual particulars, &c., to J. F. Cook, Chemist, &c., Holbeach.

A QUALIFIED Assistant (out-door), to Manage a Branch. Apply, with salary required and references, to K., care of John Ismay & Sons, Wholesale Druggists, Newcastle-on-Tyne.

A RESPECTABLE Assistant for a good business in the country. He must give references as to character and ability to Dispense well. Apply to D. E. F., care of Herring & Co., 40, Aldersgate St., London.

AN Assistant, possessing Minor, for a first-class business in an inland watering place. Two other Assistants kept. Apply, stating age, height, references, and salary required to M. N., Messrs. Hodgkinsons, Upper Whitecross St., E.C. (Enclose carte, to be returned).

JUNIOR Assistant in a light Retail and Dispensing business. Good references indispensable. Apply, stating age, height, salary required and usual particulars, to F. Kirby, Chemist, 114, Abington St., Northampton.

ASSISTANT (qualified). To board in the house but provide own sleeping accommodation. Apply, stating usual particulars, to Sharpe & Son, 34, High St., Notting Hill, London, W.

AT once. A good Junior, not under 22. Accustomed to good class business. Must be of gentlemanly appearance and address. Full particulars as to height, experience, &c. C. Lowe, Surbiton, S.W.

A QUICK and obliging Assistant, with good references. Send photo. and salary required to E. Griffith, Padstow. Also for another shop, an Apprentice or Improver. Send photo. and usual particulars.

A JUNIOR Assistant by the end of July for a Dispensing and Family business. In-doors. One who has just finished his apprenticeship in a good house. Been accustomed to Dispensing. State age and salary required. Letters not answered in 3 days declined. J. T. Bickford, Chemist, Strand, Exmouth.

AN Assistant in a general Retail and Dispensing business. Comfortable home. In-doors. Apply, stating full particulars, to R. E. Younger, 2, Northgate St., Ipswich.

BUSINESSES FOR DISPOSAL.

TENDERS wanted for purchase of stock, fixtures, lease, &c. Shop situate in a good neighbourhood, South London. Established 7 years. Proprietor taken larger concern. Approximate value £300. Address, Magister, care of Messrs. A. Hill & Son, 101, Southwark St., S.E.

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A GENUINE Mixed Country BUSINESS. Main street in a large market town within 20 miles of London. Illness sole cause of selling. For full particulars please apply DRUGGIST, care of Messrs. Evans, Lescher & Webb, 60, Bartholomew Close, London, E.C.

IN a s eadily increasing fashionable neighbourhood in the West of England.—A genuine first-class Dispensing and Prescribing BUSINESS. Plate-glass windows. Superior modern mahogany fittings. Good house, private entrance. Garden and warehouse. No agents. Apply first to C. J., Messrs. Wright, Layman & Umney, 50, Southwark St., S.E.

HANTS.—A profitable light Retail, Dispensing and Prescribing BUSINESS. Returns over £300, and rapidly increasing. Corner shop. Mahogany fittings. Situated in main street. Excellent opportunity for gentleman commencing. Thorough investigation allowed. Incoming easy. Address, F. W., care of Messrs. Edwards & Son, 157, Queen Victoria St., London.

TO an immediate cash purchaser for £500, present proprietor having entered into a much larger concern in town. A good class village BUSINESS, a few miles from London. Doing from £12 to £14 weekly, at full prices. No mixed trade and unopposed. H. T., 71, Old Kent Rd., S.E.

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IN a new and rapidly increasing suburb.—A Branch Retail, Dispensing and Prescribing BUSINESS. Main road. Well fitted and stocked. Established 1882. Long lease. Rent £50. Returns over £40 a month; increasing. Satisfactory reasons for disposing. Price £440 cash. Address, STATIM, Messrs. Davys & Co., Wholesale Chemists, Southwark, London, S.E.

CAPITAL chance to take over increasing BUSINESS, in one of the best positions in principal street of large town, South. Expensively fitted shop and convenient premises. Dispensing, Prescribing and light Retail, at good profits. Good reason for disposal. Price for everything as it stands only £250. Apply to FRANCIS & Co., Valuers, Southampton.

LONDON Suburb, S.E.—A light Retail, Dispensing and Prescribing BUSINESS, in a large and growing neighbourhood. Handsomely fitted shop and well stocked. Good house and private entrance. Business can be greatly increased by good personal attention. Rent £50. Principals with about £600 apply by letter to Mr. W. DAVIS, Warwick House, South Norwood Hill, S.E.

BUSINESSES FOR DISPOSAL.

IMMEDIATELY.—Proprietor taking a larger business. Shop well fitted and newly opened. Price £300 to immediate cash purchaser. Apply to CHEMIST, 32, Sistova Rd., Balham, S.W.

ON advantageous terms, in consequence of the death of the proprietor. An old established and most profitable Drug and Dentistry BUSINESS, situate in a busy thoroughfare of the City. Established over 50 years. Neatly fitted up corner shop. Apply, 113, London Rd., Manchester.

A SPLENDIDLY fitted SHOP, in leading position in a well known and thriving town in South Wales, to be sold at low price. Immediate possession if desired. Exceptional opportunity. Further particulars of J. J., care of Gwilym Evans, Llanelly.

£2300 returns. In good Cathedral town, West Midlands.—An old established Family, Retail, and Aërated Water TRADE. In present hands between 20 and 30 years. Drug returns, £1400; aërated waters, £900. For the latter good prices are obtained, and this department can easily be doubled with personal attention. The shop is handsomely fitted, house large, and business open to strictest investigation. Price £1400, part of which might remain for a time on security. S. J. J., care of Messrs. Burgoynes & Co., Coleman St., London.

NORTHERN town.—Thoroughly genuine and profitable Retail, Prescribing and DISPENSING, with Wines and Spirits. Returning £1800 per annum. There are some good Proprietary Articles connected with the trade, which is thoroughly genuine, and strictest investigation is solicited. Ill health is sole cause of sale, and for this reason the low sum of £850 will be accepted. A portion might remain on security. F. J. BRETT, Valuer, Leicester.

GOOD Retail and Dispensing BUSINESS, with Post Office attached, which more than pays rent, rates and taxes. There is much room for increase. Has been carried on for the past 4 years by assistants, owing to the death of proprietor. Established 80 years. Principals only treated with. No agents. CHEMIST, Messrs. Hill & Sons, Wholesale Druggists, Southwark St.

£3000. PARTNER. A good business man, with from £2000 to £3000 capital, can be admitted into a provincial firm, where more assistance and capital is required to further develope a good class Chemists' and Surgeons' Wholesale. The town is a large and important one and rapidly increasing. The district is large, with no other wholesale firm for many miles, presenting such an opportunity for monopolising the whole district as is seldom to be found, and where one of the largest wholesale businesses in the provinces can be secured. Only those gentlemen will be furnished with particulars who forward references as to possession of capital. Apply to F. J. BRETT, Valuer, Leicester.

BIRMINGHAM, Suburbs. — Immediately. Retail BUSINESS in a populous and healthy locality. The shop is in a commanding corner position near a railway station. Large and roomy house. Rent £45. For particulars, apply B., care of Southall Bros. & Barclay, Birmingham.

IN Devon.—A genteel light Retail and DISPENSING. No heavy trade. Shop handsome and well fitted. Commandingly situated in the best part of good market town. Apply to ARTHUR HUNT, Licensed Valuer, 95, Fore St., Exeter.

PRESCRIBING and light RETAIL. Plymouth. Good house. Handsome shop. Suitable for a staid, middle-aged good Prescriber. Returns about £400. Easily done. Price about £250. Apply to ARTHUR HUNT, Licensed Valuer, 95, Fore St., Exeter.

BUSINESSES FOR DISPOSAL.

IN a market town.—A small Retail and Prescribing Business. Returning between £300 and £400 a year. Full prices. A business man would find this a good opening, as he would have little or no opposition to contend with, and by personal supervision would greatly increase the trade. The business has been managed by assistants for some years. Statim, care of Messrs. Barron, Harveys & Co., Gilispur St.

WHOLESALE Druggists.—Partner wanted, with capital, to substitute senior retiring partner. Good sound business of 20 years' standing. Extensive premises, constructed for the trade. Good situation in E.C. London. Apply, by letter at first, G. W. J., Albion House, 326, City Rd.

TO BE LET.

A SHOP, in the principal thoroughfare of a wealthy suburb. Excellent opportunity for a Chemist desirous of opening a Branch business. Rent very moderate. Beautifully fitted and convenient 12-roomed house. Address, H. C., Bookstall, Beckenham.

IMPORTANT TO CHEMISTS COMMENCING BUSINESS OR MAKING ALTERATIONS.

THE entire Fittings of a Chemist's Shop to be disposed of as a whole or in part, comprising 1 Counter, 9 ft. long, containing 12 drawers; 1 ditto, 6 ft. long, range of 24 large drawers, painted mahogany, gold labels and glass knobs, with 3 rows shelving and cornice over, and also return shelving and 16 drawers; 1 plate glass Counter Case, 4 ft. 6 in. by 2 ft., nearly new; 1 Desk and Glass Case ditto, as Maw's A 32 (2 doors); 2 Specie Jars, good, 28 in. high; 6 Globes, 2 and 3 gallons; 12 3-lb. blue Jars, labelled, nearly new; 12 Pill Jars; 10 Syrup Bottles, 30-oz.; 1 4-ft. Dispensing Case, with tablet. Price for the lot, £20. Also, 1 handsome mahogany Dispensing Screen (second hand), recessed arched mirror in centre, and marble slab, total length 6 ft., height 5½ ft., price £7; 1 Counter, 6 ft. long, with Spanish mahogany top, price 55s.; second-hand stoppered Rounds, 150 pints, 75s.; 100 ½ do., 50s; 24 quart blue Syrups, 24s., all labelled, useful, and in very good condition; 1 Soda Water Stand, painted walnut, with marble slab, 35s. Richard Tomlinson, Druggists' Shop Fitter, 15, St. Paul's Square, Birmingham.

FOR SALE.

A 8ft. run of mahogany fronted Drawers, with glass knobs and gold labels, at 2/- per drawer. A 5ft., 6ft., and 7ft. plate-glass Counter Cases, as fig. A 18. A 6ft. Dispensing Screen, as fig. A 55, £5 10s. A 4ft. plate-glass Counter Case, as fig. A 10, £3. A iron Tincture Press, 10/-. A mahogany plate-glass Desk and Case, as fig. A 32. 2 doz. black Stock Bottles, 20/-; several doz. Shop Rounds, all very cheap. Bygrave, 12, Curzon Street, Wenlock Street, New North Road, Hoxton, London, N.

FOR SALE.—A BARGAIN.

DISPENSARY Fittings, nearly new, forming complete Dispensing Department, 8ft. long, with counter and drawers. Price £2 10s. Apply to H. S., 34, Jewry St., Aldgate, E.C.

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PHARMACISTS practising Dentistry not being able to undertake their own work can receive practical instruction, together with board, &c., if desired. Special terms and arrangements made with gentlemen who cannot spare much time from business. Apply, Mr. Bannerman, Surgeon-Dentist, Derby Rd., Southport.

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2. Cheshire.—Very profitable Retail, Dispensing, Prescribing and Dentistry. Returns over £700. Rent £20. Price £300.
3. London, N.W.—Neglected Business. Now returning £5 a week; capable of much extension. Price £160.
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T. & Co. have 298 other businesses in Town and Country for disposal. Gentlemen seeking investments are solicited to send particulars of their requirements.

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LEICESTER.—Mixed Retail, Prescribing and some DISPENSING, returns £750 to £800, good shop and house, at low rent, price £350.

BIRMINGHAM.—Nice suburban BUSINESS, handsomely fitted shop, good house, returns £480, and capable of considerable increase, price £350.

STAFFS.—Prescribing and light RETAIL, very profitable, through family reasons will be sold for £300, returns £550.

LANCASHIRE.—Very old established Family Retail, DISPENSING, &c., in fine position of important town, the shop is handsomely fitted and of imposing appearance, in best position of principal street, returns £1350, good house, vendor having made other arrangements will sell for £900, or valuation of stock and fixtures, excellent opportunity for good business man.

Country town, LANCASHIRE.—Nice Family RETAIL, with increasing returns, last year £635, rent £36, sole cause of sale, illness, price £350.

NOTTS.—Returns £1500, Mixed RETAIL, with good Proprietaries and some local Wholesale, price £900.

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Member of the Pharmaceutical Society,

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H. G. will be happy to furnish intending purchasers with particulars of Businesses from his Register. He has several to offer in Town and Country, to suit large or small capitalists.

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GENTLEMEN already holding appointments as Travellers and free to dispose of spare time may hear from advertiser of an article which should command a large sale. Very liberal terms. References of the highest character given and required. M. X. B., Davies & Co., 1, Finch Lane, E.C.

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Full particulars of either of the above will be furnished on application.

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VERY fine aroma, and will keep perfectly for 12 months. 1 gall. 9d. lb. 4 galls. 8d. lb. Carriage paid on 4 galls. THOMAS LUNN, Worcester.

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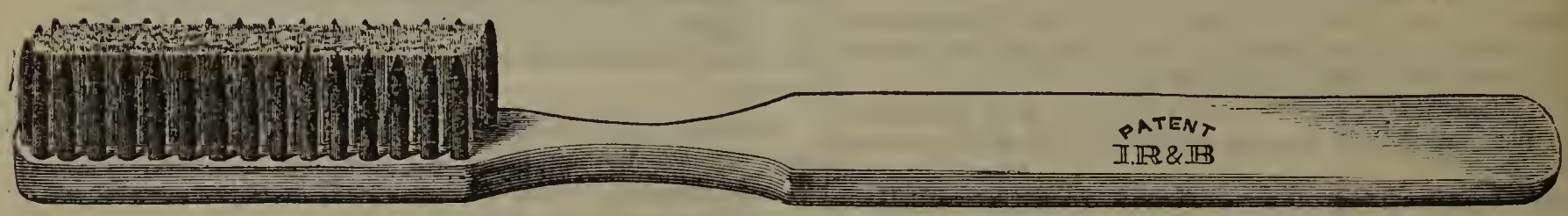

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 731.] SATURDAY, JUNE 28, 1884. [PRICE FOURPENCE

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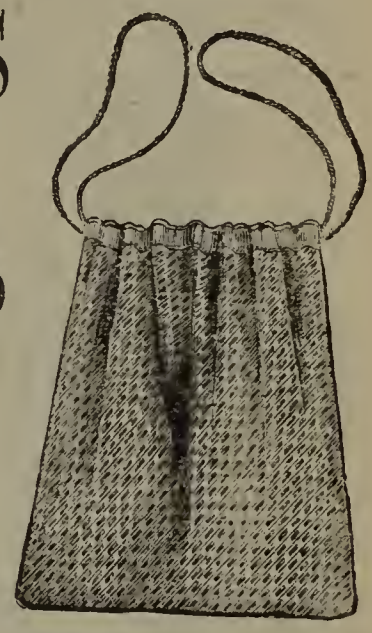

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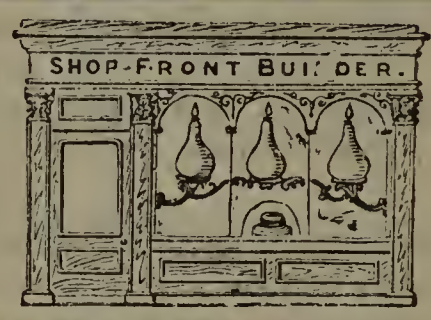

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22	,, SECOND ,, ... ,, ,, ...	200	12 5 0	6 3 0	3 2 0
23	,, FIRST ,, ... Nursery ,, ...	200	10 12 0	5 7 0	2 14 0
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The announcement of an electric battery which yields residual products of more value than that of the original materials used,—in which, in fact, the electric current generated is a kind of bye-product,—would, if capable of sustained demonstration, appear to solve one of the most difficult problems in the practical application of electricity. The Lalande battery, on behalf of which this claim is seriously put forward, is described as being formed of a series of cells, each one consisting of an iron tray containing oxide of copper, over which, but not in contact with it, is a zinc plate, the remainder of the tray being filled with solution of caustic soda. So long as the circuit remains open no action is set up; but upon the electric circuit being completed, action takes place between the oxide of copper and the zinc, the copper being reduced to the metallic state and oxide of zinc being formed. A battery made up of forty-eight such cells, each one foot square, is stated to give a current of between fifteen and twenty ampères, the electro-motive force being a little under one volt, and to be capable of supplying the current required for fifteen incandescent lamps of ten-candle power each. After the battery is exhausted the zinc oxide can be recovered from the soda solution and is estimated to be worth 25 per cent. more than the metallic zinc from which it is produced, whilst the copper oxide can be regenerated at a small cost. This claim is so far confirmed that the first practical application of the battery was by Mr. J. B. Spence, who was interested simply in the production of oxide of zinc more cheaply than by the ordinary process; but it is evident that the introduction of the battery to any considerable extent for electric purposes would tend to lower the value of the residual products.

Some months since (see before, p. 421) considerable interest was excited by the announcement that Dr. Freire, of Rio Janeiro, had detected the presence of the organism causing yellow fever in soil taken from graves of persons who had died of the fever, and that he had succeeded in communicating the disease to rabbits and guinea pigs by the injection of liquid in which the organisms had been cultivated. But in an interesting communication since forwarded to the Government from the island of Barbados an account is given of the results of a number of control experiments made by the Rev. J. H. S. Moxly, Chaplain to the Forces, who has had a medical education, and Mr. J. B. Harrison, Island Professor of Chemistry, which fail to confirm those reported by Dr. Freire in the least degree. Messrs. Moxly and Harrison's experiments were made with soil taken from the graves of persons who died of yellow fever in the epidemic of 1881 and at other times, from graves other than those of yellow fever patients, and from open fields on which no manure had been used. Previously sterilized chicken soup impregnated with any of these moulds and kept at the ordinary temperature usually became turbid in a few hours, and by the second day had assumed a bright yellow colour, especially at the top, the colour being most strongly manifested in the case of a soil from a yellow fever grave and one from an open field. The exceptions were liquids in which soil was sown taken from yellow fever graves where a layer of lime had been placed above the coffin. These coloured liquids, although crowded with bacteria, were injected into guinea pigs without producing any symptoms that could be referred to yellow fever, or, as a rule, any inconvenience. Similar negative results, so far as symptoms of yellow fever were concerned, were observed when decomposed matter was used from the coffin of a person who had died of the disease, the guinea pigs in such cases apparently dying of septicæmia, no bacteria being detected in the blood, the corpuscles of which were considerably disintegrated, and no albumen in the urine, though this is an invariable accompaniment of yellow fever in the human subject. When the "moulds" were cultivated at 98·5° F. the liquid acted much more virulently; but the symptoms were still those of blood-poisoning and not of yellow fever, the absence of bacteria from the bodies immediately after death being remarkable. Summing up their results, Messrs. Moxly and Harrison say that they can discover no difference between a micrococcus from a grave and one from a garden, and they add, with somewhat more than a *soupçon* of satire, that had Dr. Freire been a tyro with the microscope they would have been inclined to refer some of his observations to mismanagement of that instrument, but, seeing that the *Chemical News* looks upon him as possibly one of the greatest benefactors of the human race, and the *Lancet* anticipates with pleasure the continuation of the account of his experiments, they can only confess themselves "completely puzzled."

It is also noteworthy that Dr. Klein has failed to obtain results confirmatory of M. Pasteur's celebrated experience in respect to anthrax in sheep. According to M. Pasteur it is possible to obtain by cultivation of the *Bacillus anthracis* at a temperature of 42° to 43° C. a liquid that possesses the character of a vaccine against the disease. But Dr. Klein's experience with his artificial cultivations when injected into sheep was similar to a former trial upon rodents; either he obtained no result whatever from inoculation, or else the animal was killed by it, as it would be by inoculation with the original anthrax bacillus. Dr. Klein, therefore, obtained a supply of M. Pasteur's "vaccin charbonneux," as sold by the agent in Paris. This is described as consisting of two liquids,—"premier vaccin," and "deuxième vaccin,"—which are to be used in succession, the two inoculations being alleged to confer on the animals immunity from charbon. But no such results were obtained by Dr. Klein: the "premier vaccin" in some cases caused death by anthrax, and the "deuxième vaccin" was even more fatal; whilst animals that survived the two inoculations died of typical anthrax when subsequently inoculated with cultivations of *Bacillus anthracis*, showing that M. Pasteur's "vaccin" had not conferred upon them the desired immunity. Without, therefore, wishing to throw doubt on the accuracy of M. Pasteur's statement as to the results obtained in France by the vaccination of sheep with anthrax vaccine, Dr. Klein questions his statements as to the universal applicability of his results, whilst it is suggested by Dr. Buchanan that probably the conditions for the manufacture of an attenuated anthrax virus are numerous, and not all understood by M. Pasteur himself. One observation made by Dr. Klein seems to indicate a behaviour of the anthrax virus similar to that with which the small-pox virus is generally credited, and which M. Pasteur has recently attributed to the virus of hydrophobia, in undergoing an attenuating modification in the body of particular animals

It was found that the blood of a mouse that had died from anthrax, although it affected constitutionally a sheep vaccinated with it, did not produce a fatal effect, whilst the sheep became insusceptible to further inoculation with virulent material. Dr. Klein also differs from M. Pasteur as to the anthrax bacillus being capable of forming spores in the body of a dead animal and so becoming a source of danger, through the medium of earthworms, to sheep grazing in the neighbourhood.

A new reagent showing the presence of sodium and sodium salts is described by Dr. Hager (*Pharm. Central.*, June 19, p. 291), which, though subject to several limitations as to its applicability, would seem to give more satisfactory qualitative indications than the flame test in such cases as the examination of potassium carbonate or hydrate. It consists in a solution of potassio-stannous chloride, made by dissolving five parts of crystals of chloride of tin in ten parts of distilled water and adding sufficient potash solution, sp. gr. 1·145, to render it nearly, but not quite, clear; after standing an hour five parts more of potash solution and fifteen of water are added, the solution is again allowed to stand for some hours and then filtered. The solution to be examined, if acid, should be made faintly alkaline with pure potash solution, or if decidedly alkaline, neutralized with hydrochloric acid, and any salts of the earth metals should be separated by pure potassium carbonate. Boric acid also interferes with the reaction and a solution containing sodium borate requires to be mixed with potassium chloride or sulphate before adding the tin reagent. In the presence of any of the salts of sodium the reagent gives, after two or three minutes, a white precipitate or turbidity, even with only minute traces, a fact that should be remembered in preparing it, as caustic potash is seldom quite free from soda. Lithium and ammonium salts seem to behave towards this reagent similarly to sodium salts, except that the reaction with lithium is not influenced by the presence of a borate. As alcohol in the proportion of 8 per cent. also gives a white turbidity with potassio-stannous chloride its presence would require to be excluded.

Herr Sturcke has been engaged in an investigation of the constituents of carnauba wax, which, notwithstanding its growing importance, had previously been only partially examined. He reports (*Lieb. Annalen*, ccxxiii., 283) that he has recognized the presence in carnauba wax of the following bodies: (1) a crystalline paraffin-like hydrocarbon, melting at 59° to 59·5° C.; (2) an alcohol, represented by the formula $C_{26}H_{53}.CH_2OH$, and melting at 76° C.; (3) myricyl alcohol ($C_{29}H_{59}.CH_2OH$) melting at 85·5°, from which melissinic acid ($C_{29}H_{59}.COOH$) was prepared; (4) a bibasic acid, $C_{23}H_{46}(CH_2OH)_2$, melting at 103·5° to 103·8° C., and yielding the acid $C_{23}H_{46}(C_2OH)_2$, melting at 102·5° C.; (5) an acid ($C_{23}H_{47}.COOH$), melting at 72·5° C., and isomeric with lignocerinic acid; (6) an acid ($C_{26}H_{53}COOH$), melting at 79° C., identical or isomeric with cerotinic acid; and (7) an acid ($C_{19}H_{38}.CH_2OH.COOH$) melting at 103·5° C.

M. Naudin reports (*Bull. Soc. Chim.*, xli., 483) that he has separated from chamomile flowers two crystallizable bodies, one of which he has closely examined. A mixture of the two bodies was obtained by exhaustion of the flowers with light petroleum spirit and they were separated by repeated recrystallization from absolute alcohol. The compound insoluble in cold alcohol is soluble in hot alcohol and also in ether, petroleum, carbon bisulphide and chloroform, but is insoluble in water. It crystallizes in delicate microscopic needles, melting at a temperature of 63°—64° C. M. Naudin proposes to name this compound "anthemen." Upon analysis it gave results corresponding with the formula $C_{16}H_{36}$. Anthemen does appear to yield a bromine addition-product; it resists the action of strong sulphuric acid, but is slowly attacked when heated with nitric or chromic acid, with the formation of acids of the fatty series, in which property it resembles a hydrocarbon discovered by Schutzenberger in Caucasian petroleum.

The gum of a species of *Grevillea* acclimatized in Algeria has recently been examined by M. G. Fleury (*Journ. de Pharm.*, p. 479). The gum is of a yellowish or reddish brown colour, and horny consistence. In water it swells, diffuses slowly, and produces a white emulsion of a very persistent character, which easily passes through the filter. It is found by M. Fleury to consist of a gum approaching in character that of gum arabic, and a fluid reddish transparent resin without odour soluble in alcohol. This resin is also soluble in alkalies, in methylic alcohol and bisulphide of carbon; it possesses feebly acid properties and forms about 5 to 6 per cent. of the gum. The separated gum does not actually dissolve in water, but if a little potash, lime, or carbonate of potash be added to it when swelled up by water, solution takes place immediately, the solution becoming gelatinous upon the addition of a ferric salt. An alkaline solution becomes darker and more viscous if exposed to the air.

The poisonous coating of some arrows brought home by the Riebeck expedition to the east coast of Africa and the Soudan has been submitted to an examination by Professor Harnack. He reports (*Arch. exp. Path. u. Pharm.*, xviii., 1) that it resembles in appearance a vegetable extract and that he has separated from it a glucosidal non-nitrogenous substance, resembling digitalin closely in its physiological action and its products of chemical decomposition. Traces were also found of a basic substance, which appeared, however, to have no characteristic physiological action. Nothing is known respecting the source from which this poison had been derived.

Referring to the opinion recently expressed by Dr. Schunck that chlorophyll is a glucoside (see before, p. 602), Dr. A. B. Griffiths recalls his observation of the presence of crystals of ferrous sulphate in proximity to the chlorophyll granules in certain plants, and suggests that probably iron enters into the constitution of green chlorophyll, and that perhaps chlorophyll may consist of a complex molecule of iron and this glucoside (*Chem. News*, May 30, p. 237). He points out that no green chlorophyll is produced in plants growing in soils or other media free from iron, and explains the value of ferrous sulphate as manure by saying that the iron most probably acts as food for the chlorophyll granules, and the sulphur as food for the protoplasm of the cells, etc.

Muscarine, the heart paralysing alkaloid of the fly agaric, the nitrate of which is now used to some extent in medicine as a sudorific when subcutaneously injected, can be prepared artificially by the oxidation of neurine, from which it differs in containing one more atom of oxygen. In investigating

its constitution with a view to its more advantageous preparation, Herr Berleinerblaue availed himself of Herr Schmiedeberg's conclusion that it is a trimethylamine base, and inferred that by heating monochloracetal together with trimethylamine in a closed tube to 100°—120° C. a product would be obtained capable of yielding muscarine by suitable saponification (*Berichte*, xvii., 1139). The reaction went on as expected and a compound was formed that appeared to correspond in composition with a neutral ethyl ether of natural muscarine, together with another base that contained a molecule of water of hydration less. Both bases appeared to correspond qualitatively with muscarine in their physiological action, but that of the ether was the weaker.

A correspondent of the *Pharmaceutische Centralhalle* (xxv., 281) recommends the use of water that has been redistilled in the preparation of solutions of morphine for subcutaneous injection and the use of a salt as free from contamination with dust particles as possible. Ordinarily he dissolves 10 grams of morphine hydrochlorate in 200 c.c. of redistilled water at a temperature not exceeding 35° C., the solution only being submitted to filtration if any particles can be detected swimming in it with the naked eye. Such a solution he has found to keep unaltered during a month.

In reply to a question as to the best solution for an iodoform "spray," Mr. Alfred Leach writes (*Lancet*, May 31, p. 1012) that he finds it convenient to use a mixture of ethereal and chloroform solutions. The proportions he uses are—ethere salolution of iodoform, one drachm; chloroformic solution of iodoform, one scruple; fresh tincture of senega, a drachm and a half; water to two ounces. The addition of a little ol. pini sylvestris before the water is found to mask the odour of the iodoform considerably. The mixture is said to be of a straw colour, and to hold iodoform in suspension in a minute state of division.

According to Dr. Biel (*Pharm. Zeit. Russl.*, xxiii., 301) the increased consumption of iodoform in medicine has led to considerable sophistication. He recommends that it should be tested by shaking a small quantity with water, and filtering, when the filtrate should be colourless. If this filtrate be treated with solution of potassium cyanide it undergoes no change if the iodoform used was pure, but if it contained only a trace of picric acid the liquor within ten minutes shows the red-brown colour of isopurpuric acid.

In the *British Medical Journal* (June 7, p. 1126), a correspondent points out that the use of strychnia in medicine causes a distaste for tobacco and affords an easy means of breaking off the habit of smoking to those who are desirous of doing so. He found that, both when taking tincture of nux vomica and Easton's syrup, he no longer cared for his pipe, and after a time took a positive dislike to it. This may perhaps be explained on the principle that strychnia is a physiological antidote to tobacco, and that smoking would therefore cease to give its soothing effect when the system was under the influence of strychnia. If this be correct, a physiological antidote to the effects of alcohol would be worth seeking, on the chance of it producing an analogous result.

Some experiments made by Dr. Queirolo with kairin in the medical clinic at Genoa are reported (*Archiv*, xi., 425) to have shown that when this antipyretic is administered subcutaneously a greater fall of temperature is produced, which commences more rapidly and lasts longer than that following when it is taken by the mouth; whilst these effects are obtained with smaller and less frequent doses. The hypodermic injection of kairin is said not to produce any general disturbance or local symptoms, apart from a slight smarting at the point of puncture, which soon passes away. Injections were used containing 10 to 50 centigrams of kairin to each gram of distilled water, brought to a clear solution by the aid of heat and used while still at a temperature between 30° and 35° C.

Another synthetically prepared alkaloid is being put forward as an antipyretic under the name of "antipyrin," concerning the chemical constitution of which nothing has yet been published beyond the statement that it contains oxygen. It is the work of Dr. Knorr, of Munich, and is described s forming a white crystalline powder, freely soluble in water, and having only a very faint taste that can be easily masked if desired (*Pharm. Post*, June 7, p. 513). It has been very favourably reported upon by Professor Filehne, who states that he found it to reduce the temperature in cases of fever very conisderably, without producing objectionable symptoms, and that its effects were very prolonged. It was given to adults in two gram doses repeated two or three times at intervals of an hour.

Abrus precatorius still seems to be attracting some attention and is to form one of the subjects for the debate on Indian drugs at the meeting of the British Medical Association at Belfast. In the *Journal de Pharmacie* (June, p. 468), M. Patein gives an account of an examination of the testa of these seeds. He finds them to contain a large proportion of carbonate of lime and rather more iron than hæmoglobin. The colouring matter is soluble in alcohol and contains, so far as has been ascertained, a salt of iron. It is thrown down completely by subacetate of lead as a greenish precipitate. It is also turned green by alkalies and is reddened again by acids.

Reasoning from the known fact that when an infusion of jequerity seeds is applied to what are known as "granular lids" it sets up a specific ophthalmia of a croupous nature, which destroys the granulations and leaves the surface in a condition favourable for healing, Dr. Shoemaker was led to the deduction that the remedy might be applicable to other morbid processes consisting in exuberant granulations and proliferating cell growths, and showing a tendency to a slowly degenerating condition. In a paper read before the Pennsylvania Medical Society (*Med. Bul.*, May 16) he reports that he first tried it in lupoid conditions, epithelioma, and sloughing ulcers, but found the weak infusion used in ophthalmic practice of little avail, though when he used a stronger "emulsio-infusion," a specific inflammation was set up, which occasionally, when applied over extensive surfaces on sensitive patients, assumed alarming proportions. The products of the inflammation, however, formed an immense crust, under the protection of which the constructive process rapidly developed, leaving a new and healthier surface when it was removed, so that by repetition of the application cures were speedily effected. Dr. Shoemaker therefore thinks jequerity will prove to be a most powerful agent in certain affections of the skin, though only to be used with due caution.

In severe cases of small pox, Dr. Pioch recom-

mends (*Archiv*, xi., 425) the painting of the entire body with a mixture of 30 grams of tincture of iodine, 60 grams of glycerine and 25 centigrams of potassium iodide, the solution being applied every six hours with a broad brush. The treatment should begin on the fifth or sixth day of the eruption and last until the eleventh or twelfth day, the subsidence of the eruption being the indication for its cessation. A further advantage of this treatment is said to be the avoidance of pock-marks.

Dr. R. N. Wolfenden directs attention (*Practitioner*, p. 431) to the use of hydrobromate of conia in epilepsy. The dose given by him is ¼ to 1½ grain, according to age, and the results obtained appear to be such as would warrant further trial.

Signor Silvio Plevani (*Lancet*, June 7, p. 1042) has suggested among other economic antiseptic dressings the preparation of absorbent tow, which is effected in the following manner:—The tow is boiled for some time in a lye made of wood ashes or in a 10 per cent. solution of carbonate of sodium and then washed repeatedly in water. When thus deprived of greasy and resinous matter it is immersed in a 10 per cent. solution of chloride of lime and kept in it for some hours with an occasional stirring until it becomes perfectly white. It is then washed thoroughly, dried and carded.

The time for hay fever to be prevalent is now rapidly approaching, and those who suffer from it will doubtless only be too glad to learn of any successful method of treatment. Dr. W. T. Phillips, of Andover, recommends belladonna, which he found successful last year (*Br. Med. Journ.*, July 14, 1883). In the same journal (June 7, p. 1090) he now gives the dose as 1¼ minim of the succus every hour till relieved (30 min. to 3 ozs. of water). For coryza, Dr. G. E. Dobson recommends (*Lancet*, May 31, p. 978) the inhalation of the vapour of camphor and steam, the vapour being made to come in contact with the outer surface of the face surrounding the nose by means of a paper cone placed with the narrow end downwards in a vessel containing hot water and a drachm of coarsely powdered or shredded camphor. If this is continued ten or twenty minutes at a time, and repeated three or four times in as many hours, a cure is usually effected.

A new diuretic is mentioned in the *Therapeutic Gazette*, for May (p. 208), by Dr. U. S. Newlon, of Oswego, who has made some experiments with a cruciferous plant, *Vesicaria gracilis*, which grows west of the Mississippi, and finds that it is a stimulating diuretic of considerable power. Its virtues are best extracted by alcohol or acetic acid.

Dr. Campardon, in the *Bull. Gén. de Thérapeutique*, speaks highly of the use of *Lythrum Salicaria* in acute or chronic inflammations of the gastro-intestinal mucous membrane. Its properties appear to be due to tannin and mucilage. An excessive dose, such as 10 to 12 grams per day, produces gastric disturbance. The application of the powder and infusion has been found of service in the treatment of varicose ulcers. The infusion is made of the strength of 30 parts of leaves and stalks to 1000 of water. Of the powder, the dose is 1 gram in a wafer as a dose three times a day (*Therap. Gazette*, p. 238).

The fruit of *Sizygium jambolanum*, an East Indian plant belonging to the natural order Myrtaceæ, has recently been somewhat in demand on the Continent for use in the treatment of diabetes. M. Banatrala (*Répertoire de Pharmacie*, p. 169) has found, in three cases in which he has tried it, that its use led to a diminution in the amount of urine secreted and that it caused the disappearance of the sugar. These results were manifested in forty-eight hours after taking the medicine. During the time that the patients were submitted to the action of the drug they could take amylaceous food with impunity. The astringent rind of the fruit appears to be the active part.

In the *Journal de Pharmacie* for this month (p. 456) Professor H. Baillon describes a Malagasy plant called "hazigne," the fruits of which yield an oil, and the stem a resin, which are used by the natives as a remedy in certain skin diseases, such as leprosy, the itch, and ulcers. The oil obtained from the seeds is also used as food and for lamps. The hazigne is a handsome tree belonging to the Guttiferæ, and is named *Symphonia fasciculata*. The fruit is known to the natives by the name of "voa-sou-vouara." Some of the seeds are now being submitted to chemical analysis by Messrs. N. J. Regnaud and Villejean, and the results will be published in a future number of the *Journal de Pharmacie*.

In the *Practitioner* (p. 435) it is pointed out that the *Pois d'Achery*, a sort of kidney bean (*Phascolus limatus*, L.), cultivated in the Mauritius and used there as an occasional article of diet by the Creoles, exists in the form of two varieties: the one white, which is generally esteemed wholesome, and the other very prettily variegated, which is regarded as poisonous. The poisonous character of the latter is due, according to Drs. Davidson and Stevenson, to hydrocyanic acid, which is formed when the beans are macerated in water by a similar process to that by which it is produced in certain plants of the Rosaceæ, such as the almond and cherry laurel. The reason why two varieties of a plant which cannot be distinguished from each other by any definite botanical characters should produce different chemical compounds is a most interesting problem, and seems to deserve further investigation.

A Mexican plant, by name "palillo," which appears to be *Croton morifolius*, has recently been the subject of experiment in France, by Messrs Duges and Armendaris (*Bull. Soc. Bot.*, [2], v., p. 233). Two or three drops of the oil contained in the seeds act like a moderate dose of castor oil. The natives of Mexico use the leaves of the plant in the form of infusion as a remedy for gastralgia and atony of stomach. The tincture of the leaves is said by the above-named experimentalists to give excellent results in neuralgia, especially when occurring in the face, either when used as liniment, or dropped into the ears, or taken in the dose of 10 or 15 drops in orange-flower water.

At the last meeting of the New Jersey Pharmaceutical Association (*Amer. Journ. Pharm.*, June, p. 344) Professor Maisch stated that he had recently received from California some "tubers of the parent plant of the cultivated potato." The plant had been discovered by Professor Lemmon, in the Huachuca mountains, Arizona, at an elevation of nine thousand feet, and had been named *Solanum tuberosum*, var. *boreale*, by Professor Asa Gray. The tubers, which had sprouted to such an extent that they had to be planted in order to save them, are described as of two varieties, one white and the other red, but both quite small, being only about half an inch or little more in length.

An interesting paper on the "Existence and Use of Manganese in Animals and Plants" is given in *Comptes Rendus* (p. 1418), by M. E. Maumené. He points out that it is constantly excreted by animals, and therefore does not appear to be necessary to life. On the other hand, certain plants, such as tea, coffee and tobacco, require an abundance, and the want of success in their cultivation may be attributed without doubt to the absence or insufficient quantity of this metal in the soil in which they are planted.

In the *Gardeners' Chronicle* (June 14, p. 777), an illustration is given of a curious malformed fuchsia flower in which two green leaves proceed from outside the middle of the ovary, one of the leaves having a single stamen in its axil, and the other two stamens in its axil, the filaments of which are united half way.

At a recent meeting of the Royal Horticultural Society, a wallflower was exhibited which had grown through the pith of a black currant stem. In this case there was no true epidermis on the stem, which was of two years' growth, and the pith was destroyed or partly converted into cork (*Gard. Chron.*, p. 782).

Science Gossip for this month gives an illustrated paper on the Alpine gentians, the descriptions including the species which yield the gentian root of commerce, *G. lutea*, *G. purpurea*, *G. pannonica* and *G. punctata*.

Those who take an interest in the cause of variation of species in plants will find an interesting article in the *Journal of Botany*, on "Euphrasia officinalis," a species which is very polymorphic. The plant is proterogynous, but has also provision for at least two modes of self-fertilization in case cross-fertilization is not effected, the one in the larger-flowered form by the lengthening of the corolla tube so that the stamens are brought in contact with the stigma, and the other in the smaller-flowered forms by the curving downwards of the upper portion of the style. No less than eight groups, each containing several forms, are enumerated by the author, Mr. F. Townsend. In the some number of this journal a very useful list is given of the new phanerogamic plants published in periodicals during the year 1883, with references to each, the whole being arranged alphabetically. Literature of this kind is so scattered, that the list is sure to prove most useful and will doubtless help to diminish the evils arising from the multiplication of botanical names.

Dr. P. Calvo (*Journal of the British Dental Association*, p. 373) gives as the results of experiments during the last three years a remedy for lessening the sensibility of dentine of decayed teeth which does not injure the vitality of the pulp. This he has found in quicklime. By carefully drying the cavities of the teeth before inserting the powdered lime an undue rise of temperature is avoided, in consequence of the hydration taking place slowly and but little heat being developed. Lime appears to have the advantage over the more soluble alkalies of coagulating the albumen of the immediate surface and thus limiting its caustic action.

At a recent meeting of the Physiological Society of Berlin, Professor Busch (*Nature*, June 5, p. 140) made some interesting observations on caries of the teeth. He mentioned that it has been observed in none of the lower animals, and appears to be peculiar to man. It is not, however, characteristic of civilized races, but has been observed in skulls of prehistoric time. Some races are more disposed to it than others, the Celtic, Arabian and Polish races appearing to possess a relative immunity. Certain families, however, are predisposed to it. This is manifest in the undulating character of the enamel, teeth with smooth enamel having much greater power of resistance. In strong teeth the dentine tubes run regularly side by side close to each other, but in those disposed to caries the dentine tubes branch and surround cellular bodies or small air vesicles. No pain occurs in the course of caries until the pulp of the tooth is reached.

At a recent meeting of the King's County Pharmaceutical Society, Mr. Stevens reported the results of an experiment to determine the loss by volatilization of camphor when exposed to the air. A fresh block of hard camphor was selected, the corners were sharpened and the weight was ascertained to be 2606 grains. It was placed on the 26th of April on one edge in a situation open to the air, but not subject to radiant heat, direct sunlight or currents of air. The accumulated dust was occasionally lightly blown off with the breath, but the block was not dusted or rubbed. On the 13th of May, seventeen days afterwards, the block weighed 2104 grains, showing a loss of 509 grains (over 19 per cent.), or an average daily loss of 29½ grains. In length the block had lost half an inch.

THE ECONOMIC APPLICATIONS OF SEAWEED.*

BY EDWARD C. C. STANFORD, F.C.S.

(*Concluded from page* 1029.)

We now come to the treatment of the residual weed. If the long fronds of the *Laminaria stenophylla* be observed after exposure to rain, a tumid appearance will be noticed, and sacs of fluid are formed from the endosmosis of the water through the membrane, dissolving a peculiar glutinous principle. If the sacs be cut, a neutral glairy colourless fluid escapes. It may often be seen partially evaporated on the frond as a colourless jelly. This substance, which is then insoluble in water, is the remarkable body to which I have given the name of algin. The natural liquid itself is miscible with water, but coagulated by alcohol and by mineral acids. It contains calcium, magnesium, and sodium, in combination with a new acid which I call alginic acid. When this natural liquid is evaporated to dryness, it becomes insoluble in water, but it is very soluble in alkalies. This new substance is so abundant in the plant that, on maceration for twenty-four hours in sodium carbonate in the cold, the plant is completely disintegrated. The mass thus obtained is a glutinous mass of great viscosity, and difficult to deal with on that account. It consists of the cellulose of the plant mixed with sodium alginate. The cells are so small that they pass through many filters, but by cautiously heating it, the mass can be filtered through a rough linen filter bag, the cellulose being left behind, and after the algin is removed, this is easily pressed.

The solution contains dextrine and other extractive matter, and it is then precipitated by hydrochloric or sulphuric acid; the alginic acid precipitates in light grey albuminous flocks, and is easily washed and pressed, in an ordinary wooden screw press. A filter press, made for me by Messrs. Johnson and Company, answers perfectly well for this operation, but not so well for the preceding. It forms a compact cake, resembling new cheese, and has only to be stored in an ordinary cool

* Read before the Applied Chemistry and Physics Section of the Society of Arts. Reprinted from the Journal.

drying room, where it can be kept any length of time. If desired, by adding a little bleach during the precipitation, it can be obtained perfectly white. The algin can be sent out in this state, it is only necessary to dissolve it in sodium carbonate in the cold for use. If, however, it be sent out as sodium alginate, it must be dissolved to saturation in sodium carbonate; the carbonic acid is disengaged, and sodium alginate is formed. If potassium or ammonium carbonate be used, the alginates of potassium or ammonium are formed, which are similar to the soda salt. The bicarbonates of these alkalies may also be used; but the caustic alkalies are not such good solvents.

The sodium alginate forms a thick solution at 2 per cent., it cannot be made above 5 per cent., and will not pour at that strength. Its viscosity is extraordinary. It was compared with well-boiled wheat starch, and with gum arabic in an ordinary viscometer tube; the strengths employed were as follows; it was found impossible to make the algin run at all over the strength employed:—

			Seconds.
Gum arabic solution,	25 per cent.	took	75 = 1 in 3
Wheat starch	1·5 „	„	25 = 1 in 8
Algin	1·25 „	„	140 = 1 in 112

So that the algin has fourteen times the viscosity of starch, and thirty-seven times that of gum arabic.

I append analyses of two samples of commercial sodium alginate of average composition:—

	No. 1.		No. 2.	
Water	17·13		19·30	
Organic matter	59·97		58·125	
Carbonate soda	18·32	P.C. ash 22·90	17·78	P.C. ash 22·575
Neutral salts	2·98		2·77	
Insoluble ash	1·60		2·025	
	100·00		100·00	
Dry algin	67·58		65·50	
Soda (Na_2O)	10·71		10·40	
Per cent. of Na_2O	15·85		15·87	

Showing that, excluding the water, salts, and ash, the composition is uniform.

The solution may be alkaline, or neutral, or acid, according to the degree of saturation; if alkaline, it may be made distinctly acid by the addition of hydrochloric acid, but any excess at once coagulates it; a 2 per cent. solution becomes semi-solid on this addition.

The evaporation is effected in a similar manner to that of gelatine, in thin layers on trays or slate shelves, in a drying room with a current of air, or on revolving cylinders heated internally by steam; high temperature must be avoided. The solution keeps well. Thus obtained, the sodium alginate presents the form of thin, almost colourless, sheets, resembling gelatine but very flexible. It has several remarkable properties which distinguish it from all other known substances.

Algin, or sodium alginate in solution is precipitated or coagulated by alcohol, ethylic and methylic, acetone, and collodion (but not by ether), by hydrochloric, sulphoindigotic, nitric, sulphuric, sulphurous, phosphoric, citric, tartaric, lactic, oxalic, and picric acids; salts of cobalt, copper, platinum, nickel, silver, bismuth, antimony, zinc, cadmium, aluminium, chromium, uranium, barium, calcium, strontium, and tin chloride and bichloride; mercury pernitrate and protonitrate; iron sulphate (white), and iron perchloride (brown); lead acetate, and basic acetate; lime water, and baryta water.

The solution is not precipitated nor coagulated by alkalies and salts of alkalies, including lithium, alkaline silicates, potassium bichromate (not coagulated by boiling), and chromate; sodium stannate, succinate, biborate and tungstate; magnesium and manganese salts, starch, glycerine, ether, cane sugar, amylic alcohol, boracic acid, acetic, carbolic, tannic, butyric, benzoic, gallic, pyrogallic, arsenious and succinic acids; potassium ferrocyanide, mercury iodide, ferricyanide, and permanganate; bromine, iodine and chlorine water; molybdate of ammonia, tartar emetic and peroxide hydrogen. It does not precipitate the ordinary alkaloids.

It is distinguished from albumen, which it most resembles, by not coagulating on heating, and from gelose by not gelatizing on cooling, by containing nitrogen, and by dissolving in weak alkaline solution, and being insoluble in boiling water.

From gelatine, by giving no reaction with tannin; from starch, by giving no colour with iodine; from dextrine, gum arabic, tragacanth, and pectin, by its insolubility in dilute alcohol and dilute mineral acids.

It is remarkable that it precipitates the salts of the alkaline earths, with the exception of magnesium, and also most of the metals, but it gives no precipitate with mercury bichloride nor potassium silicate.

It has a strong rotary power on polarized light. Mr. Tatlock estimated it for me as having a specific rotary power of 86·5° on Laurent's polariscope. This again fixes its position among animal bodies, gelatine and albumen, and not amongst such vegetable products as pectin, which is neutral.

Alginic acid is insoluble in cold water, very slightly in boiling. It is insoluble in alcohol, ether and glycerine. The proportion of soda ash used is one-tenth of the weight of the weed, and the cake of alginic acid obtained is usually about the same weight as the weed. The quantity of dry alginic acid is given below:—

	Laminaria Stem.	Digitata. Frond.
Water	37·04	44·0
Alginic acid	21·00	17·35
Cellulose	28·20	11·00

	Laminaria Stenophylla. Stem.	Frond.	Laminaria Bulbosa. Fucus vesiculosus.	
Water	34·5	40·02	43·28	40·10
Alginic acid	25·7	24·06	17·95	12·22
Cellulose	11·27	15·06	11·15	—

Falkland Islands Giant Algæ.

Nos.	1	2	3	4	5
Alginic acid	11·21	10·09	5·56	7·44	3·34
Cellulose	8·13	7·25	3·50	12·95	9·68

The three gelatinous algæ, already referred to, contain no algin.

The cellulose in the tangle is higher than in any other weed, the outside of the stem being rather fibrous. I append also analyses of the ash of three varieties of cellulose dry, unbleached to show the trace of iodine still retained:—

	Laminaria Digitata.	Laminaria Stenophylla.	Fucus vesiculosus.
Yield of char.	38·36	36·41	44·62
Soluble	11·08	5·27	11·06
Carbon	12·73	14·27	15·93
Ash	14·55	16·87	17·63
Iodine	·12	·06	·05
On air dry plant about	·012	·006	·005

The new process may be tabulated as follows:—

	Per cent.	
Extracted by water—		
Salts	20	
Sugar, mucilage, etc.	10	
	—	30
Extracted by sodium carbonate—		
Algin	20	
Dextrine, etc.	10	
	—	30
Cellulose		10
Moisture		30
		—
		100

Of these, I have accounted for the salts, the algin, and the cellulose, leaving the mucilage, dextrine and sugar for further investigation.

It is not necessary to extract the salts first with water,

it comes to the same thing to act on the seaweed at once with soda ash, and to recover the salts by evaporation of the solution, after the alginic acid has been precipitated. In this case chloride of calcium or of aluminium may be employed, the alginate of calcium or aluminium being precipitated. With either salt the alginate is thrown down instead of rising to the surface of the liquid, and the cakes are more compact and easily pressed. In addition to the cheapness with which it can be procured in almost any quantity, as a bye-product in alkali works, now all thrown away, the calcium chloride has the advantage of throwing down the sulphates in the salts, and decomposing them into chlorides, so that the salts consist of chlorides of potassium and sodium, which are easily separated, and do not require the tedious and expensive processes necessary in the lixivation of kelp. The same remark applies to aluminium chloride, which can be cheaply obtained by dissolving bauxite in hydrochloric acid. Either salt can be decomposed by hydrochloric acid, and the calcium or aluminium chlorides recovered; or the salts can be decomposed by sodium carbonate. The calcium alginate, when dry, is very like bone, as the dry alginic acid is like horn. The aluminium alginate is soluble in caustic soda, forming a neutral solution, and giving, on evaporation, a substance like algin, but harder and making a stiffer finish; it is also soluble in ammonia, the salt becoming an insoluble varnish on evaporation. The alginates of copper (blue), nickel (green), cobalt (red), chromium (green) and zinc, are all soluble in ammonia, and form beautiful coloured insoluble films on evaporation. So also do the alginates of platinum, uranium (yellow), and cadmium. The latter is exceedingly soluble in ammonia. The alginate of chromium is also soluble in cold water, and it is deposited on boiling the solution, becoming then insoluble.

With bichrome, algin acts as gelatine, the mixture becoming insoluble under the influence of light. The silver alginate darkens very rapidly under exposure to light, and suggests applications in photography. Algin forms a singular compound with shellac, both being soluble in ammonia; it is a tough sheet which can be rendered quite insoluble by passing it through an acid bath.

Commercial Application of Algin, or Sodium Alginate.

For Sizing Fabrics.—A soluble gum of considerable elasticity and flexibility is a great desideratum; so also is a soluble substitute for albumen, which can be easily rendered insoluble and used as a mordant. As a finish, algin has the advantage over starch, that it fills the cloth better, that it is tougher and more elastic, that it is transparent when dry, and that it is not acted upon by acids. It imparts to the goods a thick clothy elastic feeling, without the stiffness imparted by starch. It has the additional advantage, which no other gum possesses, of becoming insoluble in the presence of a dilute acid, which decomposes starch or dextrine. No other gum has anything like the viscosity in solution, and therefore none will go as far in making up the solution or cover such a large surface. Lime-water, salts of calcium, barium, and various metallic salts can be employed for rendering the coating insoluble. If greater stiffness be required, the algin can be mixed with gum arabic, starch, dextrine, gelatine, albumen or glue, in any proportion.

The alginate of alumina, in caustic soda, is a stiff dressing, and in the crude, unbleached state, will be a cheap dressing for dark materials; and in the colourless state for finer fabrics. The ammoniated alginate of alumina can be used to give a glossy surface, which is quite insoluble after drying.

As to its use as a mordant in dyeing, I quote from Mr. John Christie, of J. Orr Ewing and Co., to whom I am indebted for the fine specimens of Turkey red dyeing exhibited, some of which are finished and mordanted with this new substance instead of cow dung:—"There is another application of the alginate of soda that occurred to me might be of some interest, namely, in the fixing of mordants, such as alumina or iron, upon cotton fibre. I find, so far as I have gone with the experiments, very encouraging results. I believe a very large application will be found for the alginate of soda as a dunging substitute. The mordants, when precipitated, seem to have full dyeing power, the results indicating that this substance is capable of taking the place of cow dung, as used in print and dye-works; also as a dunging substitute it will rank with arseniates, phosphate and silicate of soda, and a number of other salts, which are now largely used for the precipitation of mordants previous to the dyeing of cotton fabrics and yarns."

As an Article of Food.—Algin contains—carbon, 44·39; hydrogen, 5·47; nitrogen, 3·77; oxygen, 46·37; or about the same amount of nitrogen found in Dutch cheese. It has a slight pleasant marine taste, easily overcome if objected to, and may form a useful addition to the kitchen for thickening soups and puddings. It appears specially adapted to replace gum arabic in the manufacture of jujubes and lozenges. To make it into jelly, requires addition of gelose or gelatine, or admixture of lemon juice.

It will be useful for some pharmaceutical purposes, as for emulsion of oils, as an excipient for pills, and for fining of spirits.

For Boiler Incrustation.—The sodium alginate has a remarkable effect in resolving and preventing the incrustation of boilers. My friend, Mr. Spiller, who introduced the first, and one of the best fluids for this purpose, first suggested this application. He found it to precipitate the lime in a state in which it could be easily blown off. Further experience has fully corroborated his opinion. The solution is pumped in with the feed water, in the proportion of 1 lb. to every 1000 gallons. Where hard waters are a necessity, the saving of fuel is considerable.

For Covering Boilers.—The seaweed charcoal, in conjunction with algin, is used for this purpose, and has been largely applied under the name of "carbon cement." It is nearly all charcoal, 3 per cent. of the algin being sufficient to make it cohere. Charcoal is known to be the best solid non-conductor of heat, and in this way its application to steam boilers has been made practicable. It forms a cool, light, and efficient covering.

Algic Cellulose.—This substance bleaches easily, and under pressure becomes very hard, and can be turned and polished with facility. It also makes a good paper, tough and transparent, but with no fibre. Alone, or mixed with algin and linseed oil, or shellac, it may be used as a non-conductor of electricity, where a cheap material is required.

Although there is still a small portion of the plant not accounted for, which will, I hope, also soon be worked out, I think enough has been discovered to justify the following conclusions:—

1. The only way to effectually utilize seaweed is to import it in the raw state.

2. By following the wet process, the additional cost is fully made up by the greatly increased amount of iodine and salts obtained from the water solution, leaving two-thirds of the plant for further treatment.

3. That by extracting from this the algin and the cellulose we utilize the whole plant, and obtain two new products of considerable commercial importance.

4. That the process is extremely simple, and requires no extravagant plant; nor do operations on the large scale present any serious practical difficulties.

5. That the new substance, algin, has very remarkable properties, which may find many aplications not yet known, when it can be put on the market.

6. That the demand for such a substance in fixing and mordanting fabrics alone is enormous.

Our annual export of textile manufactures and yarns is valued at £40,000,000, or more than half the value of our total exports; and a large portion of this requires

some dressing material to fit it for the market. We import about £200,000 worth of gum arabic, a good deal of which is used for this purpose; and the war in the Soudan is raising its price, and making it scarce.

7. That the supply of raw material is almost unlimited. Seaweed damaged by rain is equally available for the manufacture of algin.

I will only add that I bring forward this process with some confidence, as the result of a quarter of a century's scientific work, and an almost equally long practical experience—an experience gained in a wide and wild school. I am satisfied, whether it may be given to me to carry it out or not to the extent it should be, it will become the process of the near future. It immediately possesses the advantage of obtaining known marketable products of considerable value, and it bids fair to open up a new industry which may become one of large extent, supplying, as it will, new products for which there is an absolute want. On the other hand, the importance of attaching a marketable value to seaweed can scarcely be overrated. No Royal Commission will give the crofters and cottars on the shores of the Hebrides and the West of Ireland anything like the satisfaction that the offer of £1 per ton for all the seaweed they could gather would. In all these places the sea quest might soon become more important than the land question. Moreover, a shipping trade in the raw material itself is a great benefit to the out-lying islands where it is obtained, it necessitates cartage, it tends to the improvement of roads and harbours, it improves communication by bringing steamers, and necessarily brings the people closer to civilization, and the great centres of industry. This is especially the case where the expenditure of every thousand pounds on the raw material means the expenditure of about as much on carriage. I have reason to know that the lairds of all these shores would not be entirely dissatisfied with such a result. We should all share in the satisfaction of knowing that one more waste product had been effectually utilized.

INDIA RUBBER AND GUTTA PERCHA CULTIVATION IN CEYLON.*

India Rubber.† *Ceara.*—In Ceylon a planted area of 977 acres is credited to this kind of rubber, but it has not yet appeared among our exports. Since it has been ascertained that the quality is excellent,‡ cultivators have been endeavouring to discover a means by which the milk can be obtained at a cost sufficiently low to give a return, but without, as yet, encouraging results. The removal of the outer separable bark, as practised in the experiments referred to in my last report, has been objected to on the ground that the bark formed in its stead is of a different character, very hard and inseparable from the green layer a second time. Instruments have therefore been devised for bleeding without such removal. A knife with two parallel blades, which took out a strip of bark, has been modified into one in which the very sharp cutting edges meet to form a V, the basal angle during use being at the cambium. Another invention avoids all cutting, being a double spur-like wheel with sharp but guarded points which puncture the bark without further injury. The milking (one can scarcely call it tapping) has also been practised on trees of various ages and at different intervals and seasons. While it is found that the yield of individual trees varies extremely,§ none of the experimenters is satisfied that the small quantity obtainable by present methods is sufficient to make the cultivation profitable at the existing price of rubber. Mr. Wall, however, who states that hundreds of young trees have been bled *daily* with the "pricker" for some weeks, and that thus a cooly can collect about half a pound of dry rubber per diem, thinks that, if trees will bear this treatment for two hundred and forty days in the year, the cultivation would be remunerative. It appears evident that milking must be repeated at frequent intervals, and (as often already pointed out) the cultivation be conducted on a large scale. Much of the 35,000 acres in private hands in Ceylon, at present growing nothing but *Lantana* and other weeds, is suitable for this hardy plant, which costs nothing to cultivate, affords a substance of a value which is continually increasing, and awaits only the discovery of a process by which the latter can be cheaply and exhaustively extracted.

Castilloa Rubber.—From a single tree at Pérádeniya a considerable crop of seedings was raised. The fruits ripened at the end of May; they are little, white, pointed nuts, about half an inch long, covered by a bright orange pulp, and some twenty to thirty are crowded together on the fleshy flattened scaly receptacle, forming collectively what is called a compound fruit: about half of the fruits ripen and contain each a single seed. I have already expressed my opinion as to the suitability of this tree for cultivation by a Forest Department as a source of prospective revenue; and as comparatively few of the plants were disposed of to private persons, I made an endeavour to get plantations of this valuable tree formed at Ratnapura and Kalutara. The plan was sanctioned by the Governor, and I gave the necessary instructions: but after three months' delay it was discovered that the trifling sum necessary could not be provided.

The growth of the largest *Castilloa* tree at Henaratgoda is, at a yard from the ground, 30¼ inches, an increase of 4¼ inches during the year.

Para Rubber.—Nine trees flowered at Henaratgoda in March, and the fruit ripened in August. About two hundred and sixty seedling plants were raised, many of which have been disposed of to persons desirous to try the cultivation. Our largest tree is now 30 inches in circumference, an increase of 4½ inches in the year.

Eighteen plants of another species of Hevea, *H. Spruceana*, were received from Kew in October. This is a native of British Guiana where it is generally known by its Arawack name "Hatie." It has been studied in its native forests by Mr. Jenman, who sent us a plant in 1881, which unfortunately died. Dr. Spruce also collected it on the Amazons. It is closely allied to *H. brasiliensis*, and grows under quite similar conditions. The specimen of the rubber sent home by Mr. Jenman for report appears to have been unfortunately mixed with some impurity which prevented its value being accurately ascertained. The plants have been put out mostly at Henaratgoda, and are doing well.

Some seeds of this species were also kindly sent to the garden by the Manager of the Ceylon Company, Limited, in July, but were quite dead. It is useless to attempt to import seeds of this description from any distance, as they lose their vitality in a few days.

Other Rubber Plants.—*Landolphia Petersiana*, one of the East African rubbers has flowered during the year, and *L. Kirkii* is now in bud at Henaratgoda. Two plants of *Tabernæmontana crassa* are now doing well. Among seeds received from Mr. L. Wray, of Perak, were some of "Gutta Singret" which appears from leaf specimens, also sent, to be a species of *Chilocarpus*, another climbing apocynaceous genus. Its rubber is not of a good quality, and is chiefly used for adulteration. A few plants were raised and are planted at Henaratgoda.

Gutta Percha.—A valuable series of dried herbarium specimens, of wood, and of the commercial products of the various gutta-producing trees of Perak, has been sent by Mr. L. Wray, jun. (collecting for Sir H. Low), which

* From the Report of the Director of the Royal Botanic Gardens.

† The import of Caoutchouc into Great Britain during 1882 amounted to nearly 20,000,000 pounds.

‡ I am informed that as much as 4*s*. a pound has been obtained for Ceylon Ceara rubber.

§ This is to be expected; for it should be recollected that the "milk" in plants is quite distinct from their sap, and is contained in special channels. It has no nutritive function, but, like the alkaloids in cinchona, is rather of the nature of an excretion. Its removal, therefore, *per se*, inflicts little or no injury on the plant.

has enabled me to determine with more certainty the species we possess is a living state. He has also sent me a copy of a report to Sir H. Low on the gutta question, which contains some valuable additional matter to that collected at Kew and published in the report of that institution for 1881, pp. 38–47.

I am now satisfied that the identification of "Gutta Sundek" with *Payena* (*Ceratephorus*) *Leerii*, on which doubt has been thrown, is correct. Mr. Wray describes the tree as partial to swampy places near the coast even where the water is salt; the wood is hard and close-grained, and the fruit sweet and eaten by the Malays. There is an inferior variety with a thinner bark known by its longer leaves. Our plants at Henaratgoda have grown quickly; their rate of growth is much more rapid than the species of *Dichopsis*—the largest are over 8 feet high; the tallest at Pérádeniya is 6 feet 2 inches.

The young plants of "Gutta Taban putih" grow very slowly. The good dried specimens now sent show this to be distinct from *Dichopsis Gutta*, but I am not able to say to which species of *Dichopsis* they should be referred. This tree is found in the lower hills, 1800 to 2500 feet, and not in the plains; the gutta is a dirty white (whence the name putih = white), coagulates slowly, and does not thoroughly soften even in boiling water. Mr. Wray also distinguishes a small-leaved variety with a longer fruit.

The specimens further confirm our previous knowledge that the best and most frequent sort of gutta percha of commerce, "Gutta Taban merah," is the produce of *Dichopsis Gutta*. Our trees of this are now nine years old, but the tallest is but 9 feet high. According to Mr. Wray, this tree attains 100 to 200 feet in height, with a clean straight trunk of 4 to 5 feet diameter, flanked at the base with large thin buttresses; the bark is $\frac{1}{3}$ to $\frac{1}{2}$ an inch thick, brown-red in colour, and flakes off; the leaves are much narrower on young plants than old ones, the flowers are white, and the seeds yield an oil solid at ordinary temperatures, but used for cooking. The gutta is at first white and cream-like, but becomes pink and ultimately brownish-red ("merah" = red), and this colour is strongly imparted to the water in which it is washed. There is a variety of this species affording a paler gutta called "Gutta Taban sutra" ("sutra" = silk), which is found at a higher elevation (500 to 600 feet).

Other sapotaceous trees affording gutta, of which specimens have been sent by Mr. Wray, are "Gutta Taban simpoo," *Dichopsis Maingayi*, Clarke—the product of which is also sold as "gutta putih"—and "gutta garru," *Bassia Mottleyana*, De Vriese, which gives a white hard sort, only used for mixing with other kinds. He also sends examples of the curious substance called "Gutta Jelutong," used for adulterating gutta percha. It is obtained from a very lofty apocynaceous tree allied to our "Rukattana" (*Alstonia scholaris*),* and recently named *Dyera costulata* by Sir J. Hooker.

The yield of the gutta percha trees seems to be very small—less even than the rubber trees. Thus, from a tree of *D. Gutta*, thought to be over one hundred years old, and over 100 feet high, Mr. Wray succeeded in extracting, by the ordinary native method of felling and ringing the trunk and branches, only 2 lbs. 5 ozs. of clean gutta. Of "Gutta Taban putih," a tree 10 inches in diameter, gave 2 lbs. 11 ozs., and one of *Payena Leerii*, 2 feet 8 inches in circumference, only $6\frac{1}{2}$ ozs. Mr. Wray has satisfied himself that only about $\frac{1}{3\,8}$ part of the gutta percha actually in the bark is extracted by this method, and he believes that by pounding and boiling the bark the whole could be obtained. As the question of the supply of gutta percha is becoming a pressing one, it is to be hoped that experiments on a large scale may confirm this opinion. To quote Sir J. Hooker ('Kew Report,' 1881, p. 38), "the time cannot be far distant when the natural sources of gutta percha will be definitely used up." In view of this contingency it behoves the Governments of those few British colonies—Ceylon being one—in which the trees will grow, to lose no time in establishing plantations, which must in the future become a valuable source of revenue. But in this colony, neither in this case nor in the case of india rubber, can anything be done until a proper forest conservancy is established.

* This appears to yield a somewhat similar substance at Singapore, called Gutta Pulei.

THE VALUATION OF TARTAR EMETIC.*

BY W. B. HART.

The adulteration and consequent lessening of the valuable ingredient in drugs and dye-wares tends to develop methods of analysis, by which the commercial value of them may be rapidly determined, and thus the user and honest manufacturer be protected. Tartar emetic, whose value to the dyer depends solely on the amount of antimony it contains, has of late been lowered in quality, until in some cases it contains only about one-half the amount of metal that a good commercial sample should have. The usual method of estimating the antimony in this salt is by means of a standard solution of iodine, as recommended in most volumetrical analysis manuals. This method gives good results in careful and patient hands, but I find that it can be well replaced by a solution of calcic hypochlorite, or common bleach liquor, of a strength of about 2° Twaddell. The value of the hypochlorite can be found by using a standard solution of sodium arsenite. The sodium arsenite is the usual decinormal solution, made by dissolving 4·95 grams of pure arsenious acid in a solution of sodium carbonate, and when cool diluting to 1 litre. About 25 grams of sodium carbonate are required.

1 c.c. = ·00355 grams of Cl, or ·0061 grams Sb.

The usual potassic iodide and starch paper are needed. The process is conducted as follows:—A weighed portion of the tartar emetic is dissolved, assisted by heat, cooled, and made alkaline with sodium carbonate. A known amount of the calcium hypochlorite solution is added in excess, this being shown by the blue colour which a drop of the liquid gives to the starch paper. The excess of calcium hypochlorite is now found by titrating with the standard sodium arsenite, until the liquid ceases to give the blue colour to the starch paper. The value of the hypochlorite added is found by taking an amount equal to that put to the tartar emetic, or an aliquot portion may be taken, making alkaline as before and titrating with standard arsenite, Penot's method. If an aliquot part is taken, the value of the whole is then to be calculated. The worth of the total hypochlorite added being known, and that of the excess also known, the amount of hypochlorite and therefore chlorine used to oxidize the antimony is thus obtained by difference. This also gives the amount of antimony. The reaction that takes place is as follows:—

$$Sb_2O_3 + 2Cl_2 + 4NaHo = Sb_2O_5 + 4NaCl + 2H_2O$$
$$\therefore 71\,Cl = 122\,Sb.$$

This process is rapid, and, for all practical purposes, accurate, the end of the reaction being sharp, and denoted at once, which with the iodine process is both tardy and tiresome.

The calcic hypochlorite solution, the value of which should be found at least once a day when required, must be kept in a stoppered bottle in a dark place, as it decomposes quickly if exposed to light and air. Even then it will not be of use long, but a fresh solution can easily be made.

The following are the results obtained by this process, along with those obtained by the iodine method, showing comparison :—

* From the *Journal of the Society of Chemical Industry*, May 29, 1884.

	Iodine Process.	Chlorine Process.
No. 1. Mean of 3 trials.	33·41 p. c. Sb	33·29 p. c. Sb
	37·048 „ „	36·944 „ „
No. 2.	36·896 „ „	36·820 „ „
	37·000 „ „	37·020 „ „
Mean	36·981 p. c. Sb	36·928 p. c. Sb

This method might be reduced to a comparative test only.

Let a standard sample of tartar emetic be procured in which the amount of antimony is known. Equal weights of the standard sample and of the sample to be tried are dissolved separately. From a Bink's or glass tap burette is added to the standard sample a solution of bleach liquor until the liquid just blues the aforesaid starch papers. The amount of bleach liquor used is noted. The second sample is treated in the same way. The relation of the antimony in the samples will be in the direct ratio of the volume of bleach liquor taken, and, therefore, in dyeing the amounts to be taken to produce a certain shade will be in the inverse ratio.

Example.—Equal weights of the standard sample (1), and of the second sample (2), were dissolved. No. 1 took 30 volumes of bleach liquor, and No. 2 took 20 volumes; then the ratio of the amount of antimony is as 3 to 2. Therefore, in practical work, for every two parts of the standard sample, three parts of the sample in question must be used and those give the same result.

NOVELTIES IN VARNISHES AND SHOE POLISHES.*

The *Scientific American* translates the following from a German publication called *Neuste Erfahrungen*:—

Reinhardt has devised a method of destroying the stickiness of varnish, which consists in placing the article in a closed vessel or chamber where it can be exposed to the action of ozonized air in motion.

A leather varnish or polish is prepared by Gunther, of Berlin, by mixing a filtered solution of 80 parts of shellac in 15 parts of alcohol, with 3 parts of wax, 2 parts of castor oil, and a sufficient quantity of pigment. The mixture is evaporated in a vacuum to a syrup. The varnish is applied to the leather with a brush moistened with alcohol or with a colourless alcoholic varnish.

Nicolet, of Lyons, prepares boot blacking by dissolving 150 parts of wax and 15 parts of tallow in a mixture of 200 parts of linseed oil, 20 parts of litharge, and 100 parts of molasses, at a temperature of 230° or 250° F. After this 103 parts of lamp-black are added, and when cold it is diluted with 280 parts of spirits of turpentine, and finally is mixed with a solution of 5 parts of gum lac and 2 parts of aniline violet in 35 parts of alcohol.

Hein, in Kaufering, makes another kind of shoe blacking by melting 90 parts of beeswax, or ceresine, 30 parts of spermaceti, and 350 parts of spirits of turpentine, with 20 parts of asphalt varnish, and adds 10 parts of borax, 20 parts of lamp-black, 10 parts of Prussian blue, and 5 parts of nitro-benzol.

Brunner uses 10 parts of bone-black, 10 parts of glucose syrup, 5 parts of sulphuric acid, 20 parts of train-oil, 4 parts of water, and 2 parts (carbonate of) soda. The bone-black and glucose are stirred with the acid in a porcelain vessel until the whole mass is homogeneous and has a shining black surface when at rest. The soda is dissolved in a little water, and boiled with the oil under constant stirring until it forms a thick liquid, and then the other mixture is stirred into it. By varying the proportions of these two mixtures the blacking is made thinner and softer, or harder and firmer. The substances sold as French polish are mostly composed of these ingredients. In this and all other kinds of shoe blacking made with bone-black and sulphuric acid, the precaution must be observed of stirring rapidly and evenly after the acid is added, otherwise lumps will be formed that are difficult to crush, and the blacking will have a granular condition that does not belong to it. Good shoe blacking must always remain soft, and show a smooth, uniform surface when applied to the leather.

* From *Pharmaceutical Record*, June 1, 1884.

BOLIVIAN CINCHONA FORESTS.*

The great progress made in the acclimatization of cinchona trees in India, Ceylon, and elsewhere, has awakened the Governments of countries where the plants are indigenous to the necessity of conserving from reckless destruction, and re-planting denuded forests, so as to be able to keep up the supply of this valuable product.

In Bolivia, since 1878, according to the report of the Netherlands Consul, private individuals and land owners have taken up the question with great earnestness, and at the present time on the banks of the Mapiri, in the department of La Paz, there are over a million of young trees growing.

New plantations have also sprung up in various other localities, either on private ground or that owned by Government. The competition of India and Ceylon in supplying the markets, has had also the effect of inducing more care in collecting and also of revisiting old spots, often with the result of a rich harvest of bark which had been left on partly denuded trunks, and the opening up of new localities. The new shoots springing up from the old stumps have yielded much quill bark, and the root bark of the old stumps has also been utilized.

The re-planting entails very little expense. The Indian tenant on an estate has a house and land from the owner (hacienda) of the estate. For this he binds himself to work for two to four days a week, at from 28 to 36 cents. per day, women and children obtaining 16 to 21 cents. per day. Thus the planting, weeding, etc., during the first two years, is but nominal in expense; after this period the trees may be left to themselves.

On Government land the expense is greater, as after an application being made, the land is put up to public auction, and may fetch a very low or a higher price, according to the bidding. The land secured, contracts are made with natives of the lower class to clear the forest and plant cinchona. The contracts are often sublet to Indians. The young plants are planted from five to six feet apart, with banana trees between, on account of their rapid growth and the shade the latter afford. From March to June, after the wet season is over, is the best time for planting, and the contractor keeps the plantation free from weeds and in good order for twelve months, when it is handed over to the owner. The following is given as the cost of the Mapiri river plantation of an area from sixty or more miles in extent:—

	Dollars.
Ground	1,200
300,000 plants at 0·14 dollars	42,000
Superintendent, buildings, etc. . . .	4,400
Interest	4,800
Total	52,400

Till the plants are above two years of age, they are liable to die from drought or the attacks of ants, and during 1878 many thousands died from these causes. At the end of the fourth year some proprietors begin to collect the quill bark by the method of coppicing.

It is feared by some that should this new venture be successful, it will prove a dangerous rival to the plantations of India, Ceylon and Java, and lower the price of bark considerably.

* From the *Journal of the Society of Arts*, June 13, 1884.

The Pharmaceutical Journal.

SATURDAY, JUNE 28, 1884.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE,, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL BILL AND PHARMACOPŒIA REVISION.

AT last the Franchise Bill has been fairly disposed of in the House of Commons, and on Tuesday the Government found a favourable opportunity for bringing forward the second reading of the Medical Acts Amendment Bill. This was moved by Mr. MUNDELLA, who said the Bill was a measure of reform which was greatly desired by the medical profession in the public interest, and pointed out that its introduction was not the result of pressure from the outside public, but of an agitation that had been going on among medical men for many years. The principal objects of the Bill were summarized by Mr. MUNDELLA as (1) the reform of the Medical Council by diminishing the number of its members, strengthening their powers, and giving to the medical profession direct representation; (2) the effecting of an approximation to uniformity in the examinations by the establishment in each division of the United Kingdom of a medical board which would regulate the examinations under the control of the Medical Council; and (3) the establishment of a *minimum* threefold qualification—in medicine, surgery and midwifery—which should be required from every person before being placed on the Medical Register. These were described as the main principles of the Bill; but it was admitted that whilst adhering to them there were many details to which the Government was not inclined to pledge itself pedantically and which might be discussed with a view to settlement in Committee. The motion for the second reading was supported by Sir LYON PLAYFAIR, who referred to some of the anomalies arising from the number of licensing boards through which the medical profession could at present be entered, and it received a more qualified advocacy from other members, who evidently were possessed of the views of certain corporations that consider their interests would be injured by the passage of the Bill in its present form. But the force of any opposition was temporarily disarmed by the minister's promise to consider objections when the Bill was in Committee, so that although the sitting came to an end before the Bill was read a second time, there was no indication that any serious objection would be raised to the motion when it next comes before the House, which according to the notices for Thursday would possibly be about the time this Journal goes to press.

One of the details in respect to which Mr. MUNDELLA's invitation will be accepted, and the one which will perhaps be the furthest of all from affecting any principle of the Bill, is that relating to the preparation of the British Pharmacopœia. It is well known to our readers that the Council of the Pharmaceutical Society has decided that the Bill ought not to be allowed to pass through Parliament without an attempt being made to introduce a provision giving to representative pharmacists an official position on the Pharmacopœia Committee. Of course there has been no desire to place any obstacle in the way of the progress of a Bill so much desired by a majority of medical men, and, therefore, no active opposition has been offered to it in the preliminary stages; but the time has now arrived when in the absence of any concession on the part of those in charge of the Bill, the pharmacists of Great Britain, if they wish to remove the disability under which they labour as compared with their *confrères* in any other civilized country, will have to exert themselves to make their wishes known to, and bring their influence to bear upon, the House of Commons. As this may be done most effectually by individuals personally submitting a statement of the facts to the members for their respective constituencies, it will be convenient that we should give here a brief *résumé* of the principal points in the case to be laid before them. It was not until the year 1858 that any provision was made for the compilation of a national pharmacopœia which should have the force of a law throughout the British empire, but by the terms of the Medical Act passed in that year the duty was entrusted to the Medical Council. At that time the pharmaceutical body in Great Britain had so recently emerged from the inchoate condition which had characterized it up to the middle of the present century that no one was surprised that pharmacists did not receive any official recognition in respect to this subject, although it was one in which they were so intimately concerned, and that it was left to the option of the Medical Council either to consult them or to ignore them. We are glad to acknowledge that to a certain extent the Medical Council has followed the former course, but this has been simply as a matter of grace and courtesy. As, however, under the fostering influence of the Pharmaceutical Society the followers of pharmacy have gradually assumed a more worthy position in this country, it has been increasingly felt that the time was at hand when they might reasonably ask for a recognized position in the Committee charged with the revision of future editions of the text-book by the terms of of which they are bound much more stringently than are medical practitioners. As an outcome of this feeling, in 1874, on the motion of Mr. HAMPSON, a resolution was passed by the Council

of the Pharmaceutical Society and communicated to the Medical Council, expressing an opinion that it was desirable to associate more practical pharmacists with any Committee which might be appointed for the purpose of preparing any future edition of the British Pharmacopœia and offering to nominate such pharmacists should the Medical Council concur with the suggestion. But the Medical Council contented itself with making the briefest form of acknowledgment of the receipt of the resolution and does not appear to have taken any further notice of it. At any rate another seven years had passed without anything being done, when the present President of the Pharmaceutical Society introduced the subject of Pharmacopœia Revision at the International Pharmaceutical Congress, held in London in 1881, when the reasonableness of the desire thus ignored was strikingly manifested as in the course of the discussion representatives from Germany, France, the United States, Belgium, Russia, Italy, Holland and Denmark rose in succession to say that in their respective countries pharmacists already occupied a position, in respect to the compilation of the national pharmacopœias, more than equal to that asked for so unsuccessfully by the pharmacists of Great Britain and Ireland. The Council of the Pharmaceutical Society, therefore, can hardly be accused of undue urgency or impatience, because when a Medical Bill was introduced into Parliament last year, re-enacting in an unaltered form the existing provisions as to the compilation and publication of the national pharmacopœia, it considered it to be a duty to attempt to urge its views more effectively. A memorial to the Privy Council was, therefore, drawn up and presented, which served as a basis for a large number of petitions afterwards presented to the House of Commons, in which it was asked that a clause should be inserted in the Bill providing for the establishment of a Pharmacopœia Committee consisting of six medical practitioners, to be nominated by the Medical Council, and five pharmaceutical chemists, four to be nominated by the Pharmaceutical Society of Great Britain, amongst whom one should be resident in Scotland, and one by the Pharmaceutical Society of Ireland. It will be remembered, however, that although about four hundred petitions were presented, they were without effect, as the Bill was withdrawn a few days before the end of the session.

The Bill having, however, been re-introduced this session in practically the same form, so far as it applies to this subject, and it having now arrived apparently within a measurable distance of being considered in Committee, the time has come for repeating the work of last year. Within the next few days, we believe, copies of petitions will be sent to Local Secretaries of the Pharmaceutical Society in the provinces and to those other gentlemen who have undertaken to canvass their respective districts and it will be very desirable that they should at once set to work to get them signed as fully as possible and arrange for their presentation by a member of Parliament as soon as ready. In addition to the form of petition issued for signature by chemists and druggists, there will be another for medical practitioners, and, considering that so far as medical opinion has yet been expressed it has been uniformly in accordance with pharmaceutical opinion, it may be hoped that many medical gentlemen will feel at liberty to affix their signatures, especially as there is no longer any danger that by their so doing they will impede the progress of the Bill. We understand that it is also intended to address to every member of Parliament a request to use his influence, and vote if necessary, in the direction of the sense of these petitions, and that in order to enable him to do so intelligently, he will be furnished with a copy of the memorial addressed to the Privy Council, as well as excerpts from the official report of the proceedings at the International Pharmaceutical Congress, consisting of the above-mentioned statements by foreign representatives upon the subject of pharmacopœia revision in their respective countries. It may be convenient to add that a report of the Congress discussion on Pharmacopœia Revision appeared in the number of this Journal for August 6, 1881, and that it was subsequently summarized in the number for April 7, 1883.

The Pharmacopœia Committee of the General Medical Council met on Friday, the 20th inst., to consider the additions and omissions which it is proposed to make in the next edition of the British Pharmacopœia. According to the *Medical Press and Circular* it has been decided that the volume shall be published before the end of the present year.

* * *

Shortly after the last number of this Journal was sent to press, Mr. Mundella, in reply to a question put by Mr. Warton in the House of Commons, stated that the Goverment Bill to regulate the sale of poisons had been drafted, but that before introducing it he was conferring with the Lord Lieutenant of Ireland as to the propriety of extending its provisions to that country.

* * *

The annual meeting in Philadelphia of the Medical Society of the State of Pennsylvania, last month, was made the occasion of the issue of a daily edition of the *Medical Bulletin*, an event that has been only once anticipated in the history of medical journalism.

* * *

Referring to the menthol derived from American oil of peppermint (see before, p. 966), which differs from the ordinary menthol at least in having the odour of peppermint, Professor Maisch suggests that it should be designated "pipmenthol," as even should it prove to be chemically identical a distinctive name would be desirable. Professor Maisch says it occurs sometimes in snow-white acicular crystals and sometimes in white needles with a satiny lustre and forming stellate groups.

* * *

We understand that the Silver Medal of the Society of Arts has been awarded to Mr. E. C. C. Stanford in recognition of the merit of his paper on the "Economic Applications of Seaweed."

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 19. Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificate was read for the first time :—L. Ehrmann.

During the evening a ballot was held and the Scrutators, Drs. Plimpton and Miller, declared the following gentlemen duly elected Fellows of the Society:—W. Alabaster, H. B. Baker, W. T. Burgess, E. G. B. Barlow, R. D. Courtney, E. J. Caley, M. H. Foye, W. F. Fremersdorff, W. F. Grace, J. Hargreaves, Baron F. Von Mueller, E. L. C. Muspratt, F. Nettlefold, A. G. Page, J. Parr, E. H. Rogers, R. S. Stephens, T. Stormouth, R. C. Tresidder, A. J. Watts, J. S. Wells.

Dr. Gladstone then took the chair while the President communicated the substance of a most important and lengthy paper entitled—

On the Magnetic Rotary Polarization of Chemical Compounds in Relation to their Composition; with Observations on the Preparation and Densities of the Bodies examined. By W. H. Perkin, F.R.S.—In a preliminary note on this subject, read before the Society about two years ago, it was shown that no definite laws could be expected by the ordinary system of comparing the rotary effect of unit lengths of fluid, and that a comparison of molecular lengths (*i.e.* such lengths of fluid that the ray of light in passing through them should in all cases traverse the same number of molecules) must be made if any relationship in the rotary effect of various bodies was to become apparent. It was further shown that the rotation due to these molecular lengths may be calculated from observations made on unit lengths by the formula $\frac{r \cdot Mw}{d}$ where r = rotation observed, Mw the molecular weight and *d* the density; and that if this number be divided by the number similarly obtained for the standard of comparison (in this case water) the result will be *the molecular coefficient of magnetic rotation*, or more briefly the *molecular rotation*. Examples were then given, calculated from original observations as well as from numbers taken from the papers of Becquerel and De La Rive, fully confirming this view, and plainly showing the existence of definite laws governing the magnetic rotary polarization. These investigagations have been continued and the present communication embodies the results of the careful observation of about one hundred and forty substances belonging to the various classes of the fatty series of organic compounds. From these results it is clear that in a strictly homologous series the introduction of each CH_2 is marked by an increase in the molecular rotation. This constant for CH_2 was found (as the means of a large number of closely concordant observations) to be 1·023. Each series has, in addition, it own initial or *series constant*, and it was found that when this initial constant has been once determined for a series by the careful observation of one of its members, the molecular rotation of any other members may be found by the formula Mol. Rot. = s + 1·023.n, where s = the initial or series constant, and n the number of carbon atoms in the molecule. It is found, however, that in speaking of homologous series the first, and in most cases the first two, members of the series must be omitted. This agrees with the results obtained by other investigators, when dealing with other chemical and physical properties, and it appears as if the influence of the hydrocarbon portion of these substances was to a greater or less extent neutralized by that of the extraneous elements, and that the truly homologous series never commences until there are at least three carbon atoms in the nucleus. Again, isomerism plays an important part, and for the above law to hold good it is necessary that the series should be homologous, not only in molecular weight, but also in molecular constitution. Thus, taking as the standard the line formed by the molecular rotation of a series of normal compounds, the numbers obtained for iso and secondary bodies of that series lie above the line, those for tertiary bodies being still higher. In fact, the increase of methyl groups tends to raise the molecular rotation, or, in other words, the more complicated the construction the greater the influence on polarized light. In some cases the influence of isomerism is still more marked, as, for instance, in the case of ethylene and ethylidene compounds, and in fact wherever there are two or more non-hydrocarbon radicals or elements present in the compound. In this case the numbers obtained vary both according to the arrangement of the carbon atoms in the nucleus, and also as to the position of the substituting radicals, whether they are on the same carbon atom, or on neighbouring, or on more distant ones. This is well shown in the case of the ethers of the dibasic acids of the $C_nH_{2n-2}O_4$ series. The acids being solid could not be examined. The normal series appears here to have the formula $COOEt(CH_2)_nCOOEt$, and the first member of the truly homologous series to be succinic or possibly glutaric ether. With the help of the malonic acid derivatives a considerable number of representatives of the lower members of this series were obtained and examined. The four ethers of the formula $C_3H_6(COOEt)_2$ will form good examples of the effect of molecular isomerism in this series. The molecular rotations are ethyl glutarate, 9·403 (calculated from succinate); ethyl pyrotartrate, 9·347; ethyl ethylmalonate, 9·272; and ethyl dimethylmalonate, 9·268. With halogen derivatives of polyvalent radicals these isomeric variations are still more marked, the bromides being especially conspicuous in this respect. Turning to the influence of the successive replacement of hydrogen in a compound—the number of carbon atoms in the nucleus remaining unchanged—by a negative radical, it will at once be seen, from what has been said on the effect of isomerism, that it becomes much more difficult to obtain any *fixed* increment as the cases of possible isomerism are so much increased, and it becomes almost impossible to say which kind of replacement should be considered as constituting the homologous series. This difficulty is much added to by the fact that it is almost impossible to obtain these poly-substituted bodies in sufficient numbers and purity for the determinations, many of the bodies, suitable in other respects, melting at too high a temperature. The abstraction of hydrogen (*i.e.*, the rendering unsaturated) of a compound has a most marked and curious influence on its magnetic rotation, raising it about one unit above the normal line for each diminution of H_2. Thus: propyl alcohol, 3·769; allyl alcohol, 4·683: difference, ·914; and ethylpropylmalonate, 10·367; ethylallylmalonate, 11·281: difference, ·914. Attempts were made to calculate from the results the rotation values of the elements, but it will be seen, on consideration, that as the isomerism of the molecule plays such a leading part in the determination of molecular rotation, the value of the elements must vary according to their position in the molecule and that the most that could be obtained would be values varying between certain limits or constants for certain series. It is believed that this variation of molecular rotation due to molecular isomerism may prove of great use to chemists in helping to determine the constitution of doubtful bodies. The following are the series constants obtained for a large number of different series:—Paraffins, C_nH_{2n+2} ·512; Isoparaffins, ·625; Alcohols, $C_nH_{2n+2}O$ ·700; Iso and Secondary Alcohols, ·845; Oxides, $C_nH_{2n+2}O$ ·642; Iso Oxides, ·932; Aldehydes, $C_nH_{2n}O$ ·264; Iso Aldehydes and Ketones, ·377; Acids, $C_nH_{2n}O_2$ ·393; Iso Acids, ·504; Formic Ethers, ethyl and above, ·495; Acetic Ethers, ethyl and above, ·370; Acetic ethers, Isopositive radicals, ·483; Ethers, methyl, ·273; Ethers, ethyl and above, ·336; Iso ethers, ethyl and above, ·449; Ethers, succinic series, C_nH_{2n-2}; Methyl,

·093; Ethers, succinic series, ethyl, ·196; Ethers, succinic series, iso positive radicals, ·432; Chlorides, $C_nH_{2n}+{}_1Cl$ 1·988; Iso and Secondary Chlorides, 2·052; Bromides, 3·814; Iso and Secondary Bromides, 3·902; Iodides, 8·006; Iso and Secondary Iodides, 8·092; Ethyl ethers, Oleic series, $C_nH_{2n}-{}_2O_2$ 1·452. All the observations were made for the D line of the spectrum, a lamp was used in which hydrogen was passed over strongly heated sodium contained in a piece of iron gas barrel, and thus the gas becoming impregnated with sodium vapour burnt at the nozzle and gave a very brilliant monochromatic flame, the size of which could be varied at pleasure. During this research a large number of careful determinations of densities of pure substances were made and attention has already been called (*Chem. News*, xlix., 122) to the relationship which the densities of members of homologous series show to one another and the curves which are formed, both by the densities and coefficients of expansion.

The author exhibited the sodium lamp, the pole pieces of the magnets, the tubes, the modified Sprengel tube for taking the densities, etc.

Professor Ayrton said that although the paper was eminently chemical, he had, as a practical electrician, listened with much interest. It would be of great importance to determine the magnetic value of the field; it would be difficult as the field was not uniform, but it might easily be made uniform. If it were uniform its strength might be measured in terms of Verdet's constant, and we might convert Dr. Perkin's numbers into absolute measurements. This having been done, the apparatus might be used to determine the strength of a current in absolute measure. It would be very portable and very convenient if a suitable liquid were chosen, so many seconds rotation of the D line would indicate so many ampères.

Dr. Glazebrook, some years ago, undertook some researches to determine the magnetorotary power of solutions of certain salts; he had met with two difficulties, the want of a good sodium flame, and the fact that the differences between solutions of varying concentration were so small. A plan somewhat similar to that proposed by Professor Ayrton for determining the strength of a current had been carried out by Lord Rayleigh. The results were not very satisfactory. Bisulphide of carbon was the liquid employed.

After the thanks of the meeting had been given to Dr. Perkin the Society adjourned over the summer vacation to November 6, the following papers, in consequence of the lateness of the hour, being taken as read :—

On the Effect of High Temperatures on Petroleum Hydrocarbons. By Drs. Armstrong and Miller.—In this paper the authors describe the results of their examination of the liquid obtained on compressing oil gas such as is made by passing the vapour of petroleum through highly heated retorts. They point out that their material is in every respect similar to that examined by Faraday in 1825, and in which he discovered benzene. Besides benzene and its homologues, the liquid from oil gas contains hydrocarbons of the ethylene and acetylene series. It is noteworthy that the latter are none of them true homologues of acetylene, as they are incapable of forming metallic compounds analogous to acetylide of copper; they are probably all derivatives of allene, $CH_2.C.CH_2$, the isomer of allylene or methylacetylene. From the fractions boiling below benzene two hydrocarbons of the acetylene series have been isolated, methylallene, $CH_3.CH.C.CH_2$, identical with the crotonylene separated by Caventou from the mixture of hydrocarbons condensed by compression of coal gas, and hexoylene, C_6H_{10}, identical with that described by Schorlemmer. The crystalline tetrabromides of these hydrocarbons have both been obtained in large quantity in a pure condition. As yet it has not been found possible to isolate the intermediate hydrocarbon C_5H_8. The fractions below benzene contain two olefines, amylene and hexylene. A study of their oxidation products shows that both of these are the normal hydrocarbons, the amylene furnishing on oxidation with permanganate normal butyric acid, the hexylene being converted into normal valeric acid; in other words the amylene is normal-propyl-ethylene, the hexylene normal-butyl-ethylene. In conclusion, it is pointed out that this is an extension of the investigation of Thorpe and Young. By heating paraffin under pressure at a comparatively moderate temperature they obtained a mixture, with corresponding olefines of lower (normal) paraffins down to pentane. At the higher temperature of the oil gas retorts, the paraffins are completely converted into olefines, acetylenes, benzenes, etc.; it is not improbable that the benzenes are products in a direct line of the action of heat on the paraffins, and that they are not built up as has been supposed from hydrocarbons of the acetylene series.

On the Decomposition of Terpenes by Heat. By W. A. Tilden.—The following are the conclusions arrived at by the author. When ordinary turpentine oil is exposed to a temperature just short of redness, the greater part of it is transformed in four different ways, viz., into an optically inactive terpene, by polymerization into a colophone, by resolution into cymene and hydrogen, by splitting up into two molecules of a pentine, C_5H_8. These are probably the immediate changes which it undergoes, the small quantities of other hydrocarbons which are simultaneously produced being the result of secondary reactions. The citrenes yield the same pentine as also does terpilene, though less readily. The pentine obtained from the terpenes is identical with isoprene. This pentine is readily polymerized by heat into terpilene. From this easy transformation of $2C_5H_8$ into $C_{10}H_{16}$ and *vice versâ* it appears probable that the molecule of terpilene is composed symmetrically of two halves. The pentine from turpentine, or isoprene as it may now be called, is a lower homologue or isomeric with a lower homologue of heptine from rosin spirit which has been shown by Morris to be probably methyl-propyl-allene. As the pentine is polymerizable by heat or by sulphuric acid into a dipentine, so the heptine may be converted into a diheptine, $C_{14}H_{24}$. It is a liquid boiling 235° to 240°, which appears to possess all the properties of the terpenes. The author intends to examine this compound to ascertain whether it is entitled to rank as a true homologue of turpentine.

A Short Note on the General Law which Governs the Dilatation of Liquids. By P. de Heen.

On the Melting Points of Certain Inorganic Substances. By T. Carnelly and L. T. O'Shea.

On Nitrification. Part III. By R. Warington.

INTERNATIONAL HEALTH EXHIBITION.

Address on the National Value of Public Health.

Delivered at the Inauguration of the Juries, June 17.

BY SIR JAMES PAGET, BART., D.C.L., F.R.S.

I shall speak only of national health. In consideration of his own self a man may be deemed healthy who lives idly, comfortably, and long; who enjoys every day of his life, and satisfies every natural appetite without consequent distress. And when such an one dies of old age, with a timely, uniform, and painless decay of every part, he may be deemed to have been completely healthy; and yet it is possible that he may have enjoyed his own health in the midst of a poor, unhealthy, and unhappy nation, to which he has done no good whatever.

If we could find a nation composed of people such as this man, we might be bound to speak of them as healthy; but we should be right in calling the whole nation utterly unsound, and might safely prophesy its complete stagnation, or its quick decline and fall.

It is not health such as this—idle, selfish, unproductive—that we want to promote either in the individual

or in the multitude. Comfortable idleness, such as that of some vagrants and some fine gentlemen, is a despicable result of good health; it is what no thorough man would ever wish for. In view of the national health and welfare, the pattern healthy man is one who lives long and vigorously; who in every part of his life, wherever and whatever it may be, does the largest amount of the best work that he can, and, when he dies, leaves healthy offspring. And we may regard that as the healthiest nation which produces, for the longest time and in proportion to its population, the largest number of such men as this, and which, in proportion to its natural and accumulative resources, can show the largest amount and greatest variety of good work.

Here let me insert, as an interpretation clause, that in all this and what is to follow the word "man" means also "woman," and "he" means also "she;" and that when I speak of work, I mean not only manual or other muscular work, but work of whatever kind that can be regarded as a healthy part of the whole economy of the national life. And I shall take it for granted that a large portion of all national welfare is dependent on the work which the population can constantly be doing; or, if I may so express it, that the greater part of the national wealth is the income from the work which is the outcome from the national health.

It is a common expression that we do not know the value of a thing till we have lost it; and this may be applied to the losses of work which are due to losses of national health. There are very few cases in which these can be estimated with any appearance of accuracy; but I am helped to the best within our present reach by Mr. Sutton, the Actuary to the Registry of Friendly Societies. In his office are the returns, for many years past, of the sickness and mortality among the members of a very large number of these societies; and, among other things, there is recorded the number of days for which each member, when "off work" on account of sickness, receives money from his society. Hence Mr. Sutton can estimate, and this he has been so good as to do for me, the average number of days' sickness and consequent loss of work among several hundred thousands of the workmen and others who are members of these societies. From the entire mass of these returns, he deduces that the average number of days' sickness, per member, per annum, is very nearly one and a half weeks; and this agrees, generally, with the estimates made in other societies by Mr. Neison and others. But the average thus obtained includes the cases of members of all ages, and among them many cases of chronic sickness and inability to work during old age. In order, therefore, to get a better idea of the actual annual loss of work through sickness he has calculated the average annual number of days' sickness of each person during what may be deemed the normal working time of life; that is between fifteen and sixty-five years of age. This he has done among the members of the large group of friendly societies known as the Manchester Unity of Odd Fellows; and then, on the fair assumption that the rates of sickness of the whole population during the working years of life would not be far different, he has calculated tables, showing the average annual rates of sickness of each person, enumerated in the Census of 1881 as living between the ages of fifteen and forty-five.

Briefly, it appears from these tables that the average time of sickness among males during the working years is 1·314 weeks—that is, a small fraction more than nine days each—in each year, and that among females it is yet a small fraction more. The result is that, among males, there is a loss of 9,692,505 weeks' work in every year, and among females a loss of 10,592,761 weeks. Thus we may believe that our whole population between fifteen and sixty-five years old do, in each year, 20,000,000 weeks' work less than they might do if it were not for sickness. The estimate is so large that it must, on first thoughts, seem improbable; but, on fair consideration, I believe it will not seem so. For the members of the Manchester Unity, who are in the working time of life, the reckoning is certainly true, and it is founded on the experience of between 300,000 and 400,000 members. In respect of health, they may represent the whole population at least as well as any group that could be taken. They are not very strictly selected; they are not picked lives; yet they are such as are able, when they are in health, to earn good wages or good salaries; and, as their prudence in joining this association shows, they are comparatively thrifty and careful persons. They do not, at all events, include many of the habitual drunkards, the cripples, or utterly invalids, or those who, through natural feebleness, or early disease, or mere profligacy, cannot earn enough to become members or maintain themselves in membership. Neither do they include many of the insane, or imbecile and idiotic, of whom there are in our population, nearly 70,000 doing no work, and losing not less than 3½ millions of weeks' work in the year.

It would be tedious to tell the grounds on which the estimate may be deemed too high, for just as many and as good could be told on which it might be deemed too low; and it is rather more than confirmed by some estimates of the annual sickness in other and very different groups of persons.

In the Army, at home, the average number of days' sickness in each year is, for each soldier, about seventeen; and, as the number of the troops in the United Kingdom is more than 80,000, we have here a loss of about 200,000 weeks' service in each year.

In the Navy, on the home stations, the average number of days' sickness in each year has been, in the last five years, for each man, nearly sixteen; so that, for the total of about 20,000 men, there is a loss of 45,000 weeks' service in each year.

The amount of sickness in the services thus appears much higher than in the Friendly Societies. This is due, in great part, to the fact that a soldier or a sailor is often put off duty for a day or two for much less illness than that for which a civilian would "go on his club." Still, the one estimate may confirm the other; for the sickness in the Army and Navy is that of picked men, who were selected for the services as being of sound constitution, and who are in what should be the best working years of life; and, if it includes many cases of sickness for only a day or two, it excludes nearly all cases of more than a few months, such as make up a heavy proportion of the average sickness in the Friendly Societies and in the general population. And I may add that the estimates from these societies, that nine days in the year may justly be thought a fair estimate of the working time lost by sickness, is confirmed by the records of sickness among the 10,000 members of the Metropolitan Police Force; for among these, including cases of long illness, such as are also in the societies, the average is more than nine days in the year.

I think, then, that we cannot escape from the reasons to believe that we lose in England and Wales, every year, in consequence of sickness, 20,000,000 of weeks' work; or, say, as much work as 20,000,000 of healthy people would do in a week.

The number is not easily grasped by the mind. It is equal to about one-fortieth part of the work done in each year by the whole population between fifteen and sixty-five years old. Or, try to think of it in money. Rather more than half of it is lost by those whom the Registrar-General names the domestic, the agricultural, and the industrial classes. These are rather more than seven millions and a half in number, and they lose about 11,000,000 of weeks; say, for easy reckoning, at a pound a week; and here is a loss of £11,000,000 sterling from what should be the annual wealth of the country. For the other classes, who are estimated as losing the other 9,000,000 weeks' work, it would be hard and unfair to make a guess in any known coin; for these include our

great merchants, our judges and lawyers and medical men, our statesmen and chief legislators; they include our poets and writers of all kinds, musicians, painters, and philosophers; and our princes, who certainly do more for the wealth and welfare of the country than can be told in money.

Before I speak of any other losses of work or of wealth due to sickness, permit me, as in parenthesis, to point out to you how very imperfectly these losses are told or even suggested by our bills of mortality. These, on which almost alone we have to rely for knowing the national health—these tell the losses of life; and more than misery enough they tell of; but to estimate rightly the misery of sickness and the losses of all but life that are due to it, we need a far more complete record than these can give.

Take, for example, such a disease as typhoid fever—that which Mr. Huxley has rightly called the scourge and the disgrace of our country. It has of late destroyed in England and Wales, among persons in the working time of life, nearly 4000 in the year. Its mortality is about 15 per cent.; so that if, in any year, 4000 die of it, about 23,000 recover from it. Of these the average length of illness is, on the authority of Dr. Broadbent, about ten weeks. Here, therefore, from one disease alone, and that preventable, we have an annual loss of 230,000 weeks' work, without reckoning what is lost with those who die. And the same may be said of nearly all the diseases that are most prominent in the bills of mortality. The record of deaths, sad as it is, tells but a small part of the losses of happiness and welfare that are due to sickness. It is as if, in a great war, we should have a regular return of the numbers killed, but none of the numbers wounded, though these, more than the kilied, may determine the issue of the war.

Let me now tell of another loss of work and of money through sickness and early death. In all the estimates I have yet referred to, no account is taken of those who are ill, or die, before they are fifteen years old. They are not reckoned as in the working time of life, though in some classes many thousands of them are; in the domestic, agricultural and industrial classes of the Registrar-General, nearly half a million of them are included, and yet the losses of work due to sickness among children must be very large. Consider the time which might be spent in good productive work, if it were not spent in taking care of them while they are ill. Consider, too, the number of those who, through disease in childhood, are made more susceptible of disease in later life, or are crippled, or in some way permanently damaged; such as those who become deaf in scarlet fever, or deformed in scrofula or rickets, or feeble and constantly invalid, so that they are never fit for more than half work, or for work which is only half well done. These losses cannot be counted, but they must be large, and there are others more nearly within reckoning—the losses, namely, which are due to the deaths of those who die young. It may justly be said that all that they have cost during their lives is so much money sunk, so much capital invested and lost. If they had lived to work their earnings would have been more than sufficient to repay it; but they have died, and their cost is gone without return. The mortality of children under fifteen in 1882, was nearly a quarter of a million. What have they cost? If you say only £8 a piece, there are more than £2,000,000 sterling thus lost every year. But they have cost much more than this, and much more still is lost by the loss of the work they might have lived to do.

It is, indeed, held, I believe, by some that these things should not be counted as losses; that we have a surplus of population, and that really the deaths of children, though they may be the subjects of a sentimental sorrow, cannot reasonably be regretted. I cannot bring myself to admit that such a thing should even be argued. I have lived long in the work of a profession which holds that wherever there is human life it must be preserved—made happy, if that can be, but in any case, if possible, preserved—and no argument of expediency shall ever make me believe that this is wrong. Indeed, I am rather ashamed—even for the purpose that I have in view—to use so low an argument as that of expediency in favour of the saving of health and of life. I am ashamed of making money appear as a motive for doing things for which sufficient motives might be found in charity and sympathy, and the happiness of using useful knowledge; but it seems certain that these are not yet enough for all that should be done for the promotion of the national health; therefore it seems well to add to them any motives that are not dishonourable; and so I add this, that we lose largely, not only in happiness, but in wealth, by the deaths of these poor children.

I will add only one more illustration of these losses, which is always suggested by looking at tables of mortality. The deaths of persons between twenty-five and forty-five years old, that is, during what may be deemed the twenty best working years of life, are annually between 60,000 and 70,000; in 1882 they were 66,000. Think, now, of the work lost by these deaths; and of how much of it might have been saved by better sanitary provisions. If one looks at the causes of their deaths it is certain that many might have been prevented, or, at least, deferred. Say that they might have lived an average of two years more, and we should have had in this year and last an increase of work equivalent to that of, at least, 6,000,000 weeks; as much, in other words, as 6,000,000 people could do in one week.

More instances of losses of work by sickness and premature death might easily be given, but not easily listened to in this huge hall. Let these suffice to show something of our enormous annual loss, not only of personal and domestic happiness—that is past imagining—but of national power and wealth. Surely we ought to strive more against it.

But, some may ask, can these things be prevented? Are they not inevitable consequences of the manner of life in which we choose or are compelled to live? No; certainly they are not. No one who lives among the sick can doubt that a very large proportion of the sickness and the loss of work which he sees might have been prevented; or can doubt that, in every succeeding generation, a larger proportion still may be averted, if only men will strive that it may be so.

Let me enumerate some of the chief sources of the waste, as they appear to oneself in practice.

Of the infectious fevers, small-pox might be rendered nearly harmless by complete and careful vaccination. Typhus and typhoid, scarlet fever and measles, might, with proper guards against infection, be confined within very narrow limits. So, probably, might whooping-cough and diphtheria.

Of the special diseases of artizans there are very few of which the causes might not be almost wholly set aside. Of the accidents to which they are especially liable, the greater part, by far, are due to carelessness.

Of the diseases due to bad food and mere filth; to intemperance; to immorality; in so far as these are self-induced, they might, by self-control and virtue, be excluded. And with these, scrofula, rickets, scurvy, and all the wide-spread defects related to them, might be greatly diminished.

It can only be a guess—but I am sure it is not a reckless one—if I say, that of all the losses of work of which I have spoken, of all the millions of weeks sadly spent and sadly wasted, a fourth part might have been saved, and that henceforth, if people will have it so, a still larger proportion may be saved.

We may become the more sure of what may be done by looking at what has been done already. Let me show some of it; it will be a relief to see something of the brighter side of this picture.

In a remarkable paper lately read before the Statistical

Society, Dr. Longstaff says:—"One of the most striking facts of the day, from the statistician's point of view, is the remarkably low death-rate that has prevailed in this country during the last eight years." In these years, the annual death-rate has been less than in the previous eight years in the proportion of two deaths to every 1000 persons living. The average number of deaths has been 50,000 less in the last than in the previous eight years. Doubtless many things have contributed to this grand result, and it is not possible to say how much is due to each of them; but it would be unreasonable to doubt that the chief good influence has been in all the improved means for the care of health which recent years have produced. This is made nearly certain by the fact that the largest gains of life have been in the diminution of the deaths from fever, and of the deaths in children under fifteen years old; for these are the very classes on which good sanitary measures would have most influence.

The annual number of deaths from typhus, typhoid, and the unnamed fevers, has been about 11,000 less than it was about twenty years ago. The annual number of deaths of children under five years old has been about 22,000 less than it was; and that of children between five and fifteen has been upwards of 8000 less.

These are large results, and though they tell of only deaths, yet they bear on the chief subject I have brought before you—the working power of the nation; for, however much we might assign to improved methods of medical treatment of fever, yet the diminished number of deaths means a very large diminution in the total number of cases. The deaths during the working years of life were 6500 less; and, this being so, we may hold that, if the average mortality was, say, 25 per cent., the diminution in the total number of cases must have been at least 25,000; and if we may believe, as before, that each of these involved ten weeks of sickness, we have, in these fevers alone, a clear saving of 185,000 weeks' work in every year.

And so, with the diminution of the mortality among children, there must have been a greater diminution in the number of costly and work-wasting illnesses, and a large saving of money that would otherwise have been sunk. And not only so, but many of the children saved in the last eight years will become bread-winners or care-keepers; and who can tell what some of them will become? or what the world would have lost if it had lost them?

Let me add only one more reckoning. In a paper last year, at the Statistical Society, Mr. Noel Humphreys said "that if the English death-rate should continue at the low average of the five years 1876–80, the mean duration of male life in this country would be increased by two years, and that of female life by no less than 3·4 years, as compared with the English life-table." And he showed further that, "among males, 70 per cent., and among females, 65 per cent., of this increased life would be lived between the ages of twenty and sixty years, or during the most useful period."

I should like to be able to tell the value in working power of such an addition to our lives. It is equal to an addition of more than 4 per cent. to the annual value of all the industry, mental and material, of the country.

But, some will say, admitting that it is desirable, though seeing how keen the struggle for maintenance already is, can more than this be done? and the answer may be and must be, much more. In this, as in every case of the kind, every fruit of knowledge brings us within reach of something more. While men are exercising the knowledge they possess, they may be always gaining better. This Exhibition has scores of things which are better helps to national health than those of the same kind which we had twenty years ago, and with which the gains already made were won. If I were not in near official relation with the jurors, I would name some of them; there are truly splendid works among them.

But do not let me seem to disparage the past in praising the present. It is difficult to speak with gratitude enough of what has been done, even though we may now see ways to the yet better.

Anyone who has studied the sources of disease during the last thirty years can tell how and where it has been diminished. There is less from intemperance, less from immorality; we have better, cheaper, and more various food; far more and cheaper clothing; far more and healthier recreations. We have, on the whole, better houses and better drains; better water and air, and better ways of using them. The care and skill with which the sick are treated in hospitals, infirmaries, and even private houses, are far greater than they were; the improvement and extension of nursing are more than can be described; the care which the rich bestow on the poor whom they visit in their own homes, is every day saving health and life; and even more effectual than any of these is the work done by the medical officers of health and all the sanitary authorities now active and influential in every part of the kingdom.

But good as all this work has been, we may be sure it may become better. The forces which have impelled it may still be relied on. We need not fear that charity will become cool, or philanthropy inactive, or that the hatred of evil will become indifference. Science will not cease to search for knowledge, or to make it useful when she can; we shall not see less than we do now, and here, of the good results of enterprise and rivalry, or of the sense of duty, or of the sorrow for shame that there should be these evils in the land.

What more, then, it may be asked, is wanted? I answer, that which I have tried to stir; a larger and more practical recognition of the value and happiness of good national health; a wider study and practice of all the methods of promoting it; or, at least, a more ready and liberal help to those who are striving to promote it. In one sentence, we want the complete fulfilment of the design of this Exhibition, with all the means towards health and knowledge that are shown in it, and with its hand-books, lectures, conferences, and the guidance which will be given by the verdicts of its juries.

We want more ambition for renown in health. I should like to see a personal ambition for renown in health as keen as is that for bravery, or for beauty, or for success in our athletic games and field-sports. I wish there were such an ambition for the most perfect national health as there is for national renown in war, or in art, or commerce. And let me end soon by briefly saying what I think such health should be.

I spoke of the pattern healthy man as one who can do his work vigorously wherever and whatever it may be. The union of strength with a comparative indifference to the external conditions of life, and a ready self-adjustment to their changes, is a distinctive characteristic of the best health. He should not be deemed thoroughly healthy who is made better or worse, more or less fit for work, by every change of weather or of food; nor he who, in order that he may do his work, is bound to exact rules of living. It is good to observe rules, and to many they are absolutely necessary; but it is better to need very few besides those of moderation and cleanliness, and, observing these, to be able and willing to live and work hard in the widest variations of food, air, clothing, and all the other sustenances of life.

And this, which is a sign of the best personal health, is essential to the best national health. For in a great nation, distributed among its people, there should be powers suited to the greatest possible variety of work. No form or depth of knowledge should be beyond the attainment of some among them: no art should be beyond its reach; it should be excellent in every form of work. And, that its various powers may have free exercise and influence in the world, it must have, besides, distributed among its people, abilities to live healthily wherever work must be or can be done.

Herein is the essential bond between health and education; herein is one of the motives for the combination of the two within the purpose of this one Exhibition. I do not know whether health or knowledge contributes most to the prosperity of a nation; but no nation can prosper which does not equally promote both; they should be deemed twin forces, for either of them without the other has only half the power for good that it should have.

It is said, whether as fact or fable, that the pursuit of science and of all the higher learning followed on the first exercise of the humanity which spared the lives of sick and weakly children; for that these children being allowed to live, though unfit for war or self-maintenance, became thinkers and inventors. But science and art are not dependent upon invalids; minds are not the more free or the better now for having to work in feeble bodies; each nation needs for its full international influence both health and knowledge, and such various and variable health, that there should be few places on earth or water in which some of its people cannot live, and multiply, and be prosperous.

If, therefore, we or any other people are to continue, ambitious for the extension of that higher mental power of which we boast, or for the success of the bold spirit of enterprise with which we seek to replenish the earth and subdue it; if we desire that the lessons of Christianity and of true civilization should be spread over the world, we must strive for an abundance of this national health, tough, pliant, and elastic, ready and fit for any good work anywhere.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The annual general meeting of the above Association was held at 53, Conduit Street, on May 14.

The report of the past session was read and adopted. It stated that the Association then numbered ten honorary, and sixty-one ordinary members, twelve new members having been enrolled during the session. Twenty-three meetings had been held during the past session, including five social and musical evenings. The largest attendances had been 31, 31, 30, 28 and 24, the aggregate 417, showing an average of 18. Sixteen papers on different subjects had been read, notices of which have from time to time already appeared in this Journal. The social evenings had continued to be a marked success. The annual dinner, held as usual at the Holborn Restaurant, under the presidency of Mr. S. R. Atkins, had been very largely attended. The Council, in the hope of increasing the usefulness of the Association, and augmenting the advantage of membership, had, during the past session, subscribed to Mudie's library, and, subject to certain rules, had supplied all kinds of books obtainable from that library, other than works of fiction. In conclusion the Council expressed its gratitude to the authors of papers, to donors to the funds of the Association, and to the large body of the trade generally, who had shown their kindly feeling towards and interest in the Association.

The report having been read, the following gentlemen were elected members of the Council for the esuing session :—Messrs. Parkinson, Hadfield, Winfrey, Millhouse, Braithwaite, Williams, Cracknell, Burnett, Dodd, Cunningham, Baily, Flintan, Perkins and Flint.

The balance sheet for the past year was then accepted, and the meeting adjourned.

CONFERENCE OF INSPECTORS OF WEIGHTS AND MEASURES.

The annual conference of the British Association of Inspectors of Weights and Measures was opened at Glasgow on Tuesday morning, the members assembling in one of the halls in the Christian Institute. There was a numerous and representative attendance. Bailie Fullerton, of Greenock, was called upon to preside over the opening proceedings.

The Chairman said this was the first occasion on which the Association had met in Glasgow, and he believed that the interests which it sought to advance could not fail to recommend it to the general public of the West of Scotland. A desire to see the national system of weights and measures brought to a high state of perfection, and an anxiety to promote the enactment of such imperial statutes or corporation bye-laws as were most likely to secure just dealing, and leave no loophole for fraud, was surely a laudable ambition for this or any other society to have in view. At last year's meeting at Sheffield some time was occupied in discussing the Weights and Measures Act of 1878, and a number of suggestions of a valuable nature were discussed and submitted for the consideration of the Board of Trade. He trusted that the outcome of the deliberations during the present meeting of the Association would tend to the rectification of any abuses in connection with the Weights and Measures Act, and lead to improved legislation on the question, and that the proceedings would meet with the approbation of the country at large.

The report of the Committee, read by the Secretary, stated that the past year had not furnished anything very striking with regard to weights and measures. It must be apparent to anyone who had any experience of the working of the Weights and Measures Act how few local authorities attached that importance to it which the matter deserved; and unfortunately what was true of the local authorities was to a certain extent true of many inspectors. With a view of trying to create a more lively and genuine interest in the question of weights and measures, the Committee had issued information on the subject to others than members of the Association, in the hope that the seed thus sown might bear fruit at no very distant day. During the year the Committee, it was reported, had forwarded resolutions to the Board of Trade against legalizing a new standard weight of 112 lb., and in favour of the inspection of Post Office scales and weights by duly authorized inspectors. The membership at present was as follows:—30 ordinary, 18 extra-ordinary and 11 honorary members; or a total of 59, against 53 last year.

Mr. W. H. Hopkins, Treasurer, submitted the financial statement of the Association's position. The income was stated at £76 0*s.* 9*d.*, and after meeting the expenditure a balance of £30 8*s.* remained, that sum being £3 4*s.* 9*d.* less than the sum the Association began the previous year with. This, it was explained, was only an apparent falling off, as subscriptions to the amount of £30 were still to be paid.

Mr. J. Hare, Birmingham, moved that Leeds be the next place of meeting. He had been desirous that London should have been chosen rather—they had many prejudices to attack there at headquarters—but Leeds was a place of very great importance.

Mr. Shaw, Edinburgh, seconded the proposal, and it was unanimously adopted.

Mr .William Scott Brown (Manchester) was then re-elected President for the ensuing year. Alderman Chunley was re-elected Vice-President, and the Treasurer, Secretary, Committee and Auditors were afterwards appointed

Opposition to the Proposed 112 *lbs. Weight.*

Mr. Walker (Glasgow) laid before the Association a motion to the effect that the members of the British Association of Inspectors of Weights and Measures respectfully submit to the Board of Trade that they do not consider it at all necessary, and certainly not desirable, that a new standard weight of 112 lbs. should be legalized, and for the reasons that it was so near in size to the cental or 100 lbs. weight, and in consequence liable to be used fraudulently; that anyone requiring such a large weight could use the already legalized cental; that if a concession was to be made to one business the Board

of Trade could not consistently refuse to grant a special weight to any other business; and that the concessions asked for by the ironmasters, if granted, would destroy the main principle of the Weights and Measures Act, 1878. Mr. Walker's chief objection to the new weight was the increase of the already large number of standard weights—ninety-four being at present in use.

Mr. A. Pickering seconded the motion, and others having spoken in its favour, it was adopted.

The Inspection of Post Office Scales.

Mr. Wimhurst moved that, in the opinion of the meeting, it was not only desirable, but absolutely neccessary for the protection of the public, that duly authorized inspectors of weights and measures should be empowered to enter any place where weights and scales were kept and used by the *employés* of the Post Office. Mr. Wimhurst referred to the action of the Post Office authorities in Manchester in securing exemption from inspection by the inspectors of weights and measures. He trusted that the result of the correspondence that had taken place between the Board of Trade and the Post Office would be that the inspectors of weights and measures would be allowed to go into post offices, so that the public would have confidence in these scales.

Mr. Walker seconded the motion, which was ultimately adopted.

Illegal Weights in Government Offices.

Mr. Pickering (Sunderland) proposed that the meeting should call the attention of the Board of Trade to the continued use of the old troy weights in some districts and in Government offices—the latter fact being given as a reason by a magistrate who dismissed a summons for the use of such—and the stamping of new weights of such denominations, which is clearly illegal.

Mr. Walker seconded, and the resolution was agreed to.

Inspectors' Fees.

Mr. Shaw submitted a motion that pleaded for an amendment of the Weights and Measures Act of 1878, to secure compulsory uniformity of fees for the verification and stamping of weights and measures established throughout the United Kingdom, and that legislation should be passed to that effect without unncessary delay. The motion also proposed that a committee of the Association be appointed to present to the Board of Trade a memorial embodying the resolution, and with powers to take all necessary steps to secure an early accomplishment of the object in view.

Mr. Walker seconded the motion, and it was adopted.

The Vagaries of Weights Makers.

Mr. Pickering moved that, in the opinion of the Association, it is highly desirable, for several reasons, that the vagaries which distinguish the manufacture and stamping of ordinary commercial weights should in future be avoided; and that the inspectors, anxious to make progress in this direction, request the Honorary Secretary to address to the manufacturers a friendly communication, asking them to take such steps, either in concert or otherwise, as will give uniformity in the style of stamping the denomination on weights, particularly brass weights, so that adequate room may be left for the stamp of verification, and a greater measure of regularity, neatness and efficiency attained.

Mr. J. Parnall (Bristol) seconded the motion, and it was adopted.

Afternoon Sitting.

At the afternoon sitting Mr. W. H. Hopkins, of Manchester, took the chair at the commencement of the proceedings.

Mr. W. Shaw, of Edinburgh, read a paper entitled "Observations on the Weights and Measures of Apothecaries, and the necessity existing for exactness in comparing and verifying the same." After alluding to the weights and measures in general use for many years, for dispensing medicines, until the new series were legalized in 1879, he spoke at some length upon the suspicious way in which the drug trade looked upon inspectors. Suggestions that had been made by the Board of Trade had turned out to be of no use, as the inspectors had no power to enforce them. At length, in 1880, standards were got, and three months' time was given before any visits were made. No undue haste was shown. however, in carrying out the new regulations. Although about eighteen months were allowed to elapse before he made any visits, he found large numbers of the weights in use in Edinburgh incorrect, some being too heavy and others too light. Some of them were dangerously wrong for dispensing certain kinds of medicines. Measures and balances were also found to be wrong. It was clearly the duty of the inspectors to see that such shops in their districts were visited—not in a persecuting spirit, but to make sure that things were being kept all right.

Mr. Wimhurst read a paper on the 24th, 25th and 29th sections of the Weights and Measures Act, 1878, and the 8th section of the Licensing Act, 1872. He alluded to the use of glass measures by licensed traders, which in several districts had been examined, and orders given to have them sent in and stamped. In one or two towns no action had been taken with regard to glasses marked half-pints, but he thought that inspectors should deal with all kinds of glass measures. It was perhaps not so easy to make a correct glass measure as a pewter one, but since attention had been given to this subject it was astonishing to find the improvement that had taken place in their manufacture. It was distinctly stated in the Act that all quantities of liquids asked for over half a pint should be served in a glass vessel. When customers did not ask for the liquor according to imperial measure they were liable to to be served with smaller quantities. Any glass measure could be made quite accurate by making it a little larger than at present, and putting a line round the rim to indicate how far it should be filled up to give the exact quantity marked upon it. He thought that powers should be given to inspectors to make purchases, and prosecute if the correct quantity was not supplied.

Mr. Richmond referred to a recent prosecution in Glasgow, which went to the Court of Session, when Lord Young dismissed the case, saying that the measures taken away were "local and customary ones,' if not recognized in the Board of Trade list or stamped.

Mr. Walker (Glasgow) explained that the measures complained of, not being imperial ones, could not be verified by the inspector. The attention of the shopkeeper who was using them was called to the circumstance, and he was requested to cease using them, but declined to do so. The measures were then seized and a prosecution raised, but, while the local magistrate convicted, Lord Young dismissed the case, chiefly on account, it was believed, of the way in which the prosecution was conducted.

The Dinner.

In the evening the members of the Association and their friends dined together in Macgregor's Hotel.

Parliamentary and Law Proceedings.

NEW YORK STATE PHARMACY LAW.

An Act to establish a Board of Pharmacy and to regulate the practice of pharmacy for all the counties of New York State except New York, Erie, and Kings.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:—

Section 1. There shall be established and created a Board of Pharmacy as follows:

1. Within ninety days after the passage of this Act the New York State Pharmaceutical Association shal

nominate ten pharmacists, residents of the district to which this Act applies, from which number the Governor of the State shall, within twenty days after notice to him of such nomination, appoint five, who shall constitute the Board of Pharmacy.

2. It shall be the duty of each member of the Board of Pharmacy, immediately after the receipt of the notice of his appointment, to appear before the clerk of the county in which he resides, and make and subscribe an oath to properly and faithfully discharge the duties of a member of the said Board of Pharmacy.

3. One of said members shall hold office for one year, one for two years, one for three years, one for four years, and one for five years from the first Tuesday of September, in the year one thousand eight hundred and eighty-four, which term shall be determined by lot at the first meeting of said Board of Pharmacy.

4. The said members of said Board shall meet on the first Tuesday of September, in the year one thousand eight hundred and eighty-four, at the College of Pharmacy building, in the city of Albany at twelve o'clock, noon, of that day, and shall immediately proceed to organize by determining by lot the respective terms for which they shall hold office, and by electing a President, Treasurer, and Secretary, who shall hold their respective offices for the term of one year.

5. The Board shall hold meetings at least once in three months. Three members shall constitute a quorum.

6. The said Board shall have power to make such bye-laws, not inconsistent with the constitution, or the provisions of this Act, as it may deem necessary.

Section 2. It shall be the duty of the Board of Pharmacy—

1. To examine all persons applying for licences under this Act, and to grant licences to such persons as may be entitled to the same.

2. To keep a record of licensed pharmacists.

3. To investigate all complaints of disregard, non-compliance, or violation of the provisions of this Act, and to bring all cases of violation to the notice of the proper prosecuting officers.

Section 3. Any person who at the time of the passage of this Act is carrying on the business of retailing or dispensing drugs, medicines, or poisons, or practising pharmacy on his own account, or who, at the time of the passage of this Act, shall have served five years or upwards at the business of retailing or dispensing drugs, medicines, or poisons or practising pharmacy, and who is over the age of twenty-one years, or any person who holds a certificate of registration as a pharmacist from any Board of Pharmacy legally created under the laws of this State, or any person who holds a diploma as a graduate of any incorporated college of pharmacy of this State, shall be granted a licence by said Board of Pharmacy to practise as a pharmacist upon compliance with the requirements hereinafter stated.

Section 4. Any person entitled to a licence as a pharmacist, as provided for in section 3, who shall not, within ninety days after the organization of the Board of Pharmacy, as herein provided, make a written application to such Board for such licence, accompanied by a written statement signed by him or her and duly verified before an officer authorized to administer oaths within this State, fully setting forth the grounds upon which he or she claims such licence, shall be deemed to have waived his or her right to a licence under the provisions of said section.

Section 5. No licence shall be granted to any person under the provisions of section 3 of this Act unless the applicant pays to said Board of Pharmacy the sum of five dollars.

Section 6. The said Board of Pharmacy shall make such regulations for the examination of applicants for licences and the granting of licences to such applicants and the payment of licence fees as it may deem proper, but no licence fee shall exceed the sum of five dollars.

Section 7. The New York State Pharmaceutical Association shall, annually, after the first Monday in June, in the year eighteen hundred and eighty-four, nominate ten pharmacists, residents of the district to which the Act applies, from which number the Governor shall fill the vacancy annually occurring in the Board, and the person so appointed by the Governor shall hold office for five years. In case of the death, resignation, or removal from the State of any member of the Board before the expiration of his term of office, or in case of vacancy occurring from any other cause but expiration of term of office, the Governor shall fill the vacancy from the list of names nominated as aforesaid during the year in which such vacancy occurs, and the person appointed shall hold for the unexpired term of his predecessor.

Section 8. Every person to whom a licence is granted by said Board of Pharmacy shall display the same in a conspicuous part of the pharmacy in which he or she does business.

Section 9. No licence granted by said Board of Pharmacy shall be revoked except for just and sufficient cause.

Section 10. It shall be unlawful, after the first day of January, in the year one thousand eight hundred and eighty-five, for any person to practise as a pharmacist unless he or she shall have been granted a licence by said Board.

Section 11. Nothing in this Act shall be so construed as to apply to the business of a practitioner of medicine, nor to prevent practitioners of medicine from supplying their patients with such articles as they may deem proper; nor to those who sell medicines and poisons at wholesale; nor to the manufacture or sale of patent or proprietary medicines; nor to the sale of the usual domestic remedies by retail dealers in the rural districts. And nothing in this Act shall be so construed as to prohibit the employment in any pharmacy of apprentices or assistants, for the purpose of being instructed in the practice of pharmacy: but such apprentices or assistants shall not be permitted to prepare and dispense physicians' prescriptions, or to sell or furnish medicines or poisons except in the presence of and under the personal supervision of a licensed pharmacist.

Section 12. All violations of the provisions of this Act shall be deemed misdemeanours and shall be punished as such.

Section 13. This Act shall not apply to the counties of New York, Erie, and Kings.

Section 14. All Acts and parts of Acts inconsistent with the provisions of this Act are hereby repealed.

Section 15. This Act shall take effect immediately.

ANSWERS TO CORRESPONDENTS.

R. H. Burchell.—"Methylated finish" is exempt from payment of duty. But it must contain at least three ounces of shellac, seedlac, sandrac, or colophony dissolved in every gallon; otherwise it can only be sold under licence as methylated spirit.

T. R. D.—The right to use the term "pharmaceutical chemist" is not transferable from one person to another.

J. B.—For a recipe for india rubber cement, see before, p. 600.

E. J. H.—(1) The question has not yet been legally decided. (2) The seller of such a wine would require to hold a wine licence, unless by the manner in which it was advertised it was brought within the scope of the Patent Medicines Act.

D. P.—The Syrupus Ipecacuanhæ, P.G., the formula for which is—Bruised ipecacuanha root, 1 part; macerate for twenty-four hours in spirit (sp. gr. 0·892) 5 parts and water, 40 parts; filter 40 parts and add sugar, 60 parts, to make a syrup and filter cold. All parts by weight.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Wilkinson, Kinninmont, Hutchinson, MacEwan.

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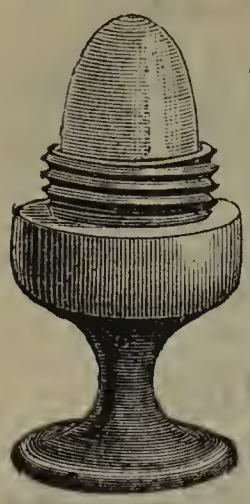

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TESTIMONIAL.

BUCKLEY HOUSE, LLANDUDNO,
March 10th, 1884.

GENTLEMEN,

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I am, Gentlemen,
Yours very truly,
M. A. S.

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For full particulars apply to Messrs. WILLS & WOOTTON, Trinity Square, London, S.E.

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THE MANCHESTER

COLLEGE OF PHARMACY,

225, OXFORD STREET, MANCHESTER.

Mr. W. S. TURNER, Pharm. Chemist, M.P.S.

At the Minor Examination held in London on June 18th, one Student from this School passed, viz.—

Mr. F. A. ASTLEY, St. Anne's-on-Sea.

It is expected that the next Session will begin on Monday, August 18th, so as to give Students working for the October Examination more time. The new prospectus, giving full particulars of the School, will be ready for distribution shortly

Special note for **Major** men.—For the future, until notice is given, **the fee for Major Students shall be from half to three quarters of that paid by the Minor Students**, and a time table can be arranged by which they shall receive full attention without interfering with the Minor time tables at all.

WESTMINSTER COLLEGE

At the Examinations held this month, the following Students of this College were successful :—

MINOR.

Mr. J. E. S. Bunn .....Halstead.
„ C. G. Davies..... London.
„ J. R. Evans .....Dowlais.
„ L. J. W. Jones.....Swansea.
„ W. G. Sloan.....Barking.
„ G. Stevenson .....Hucknall Torkard.

The next Session will commence on Monday, September 1st.

Students intending to enter on the above date are requested to send in their names as early as possible, so that benches may be reserved for them.

FEES :—

To the October Examination	...	£5 5s.
To the December „	... ...	£8 8s.
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325, KENNINGTON ROAD, S.E.

Director : Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

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For Fees, Syllabus, &c., apply to W. Baxter, Secretary.

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ENGAGEMENTS WANTED.

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